GENDER COUNTS:
MEN, WOMEN AND ELECTORAL POLITICS, 1893-1919

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Abstract

Gender has seldom been considered in accounts of electoral politics and voting in early twentieth century New Zealand. This thesis approaches the question of gender and electoral politics in three ways. The first is a case-study of the 1893 election campaign in Christchurch based on qualitative data. Gender threaded through both political organisation and debates in this election campaign. Men and women organized separately and invoked gender difference in the discussion of election issues. The second approach is a quantitative study across time and space comparing men's and women's participation rates in general elections from 1893 until 1954. Women's turnout was significantly lower than men's in the 1890s, but the difference had largely disappeared by the late 1940s. Moreover, although broad social changes increased women's participation relative to men's, factors such as party organisation and the nature and content of political debates were also important. The third approach is a statistical analysis comparing men's and women's voting preferences on the liquor issue and for the political parties at electorate level from 1893 until 1919. The analysis is of an ecological nature. It is designed to overcome the absence of individual-level voting data and to limit the ecological fallacy problem which is the error of assuming that relationships evident at the group level reflect relationships at the individual or sub-group level. The thesis reviews and trials five methods for ecological inference: Goodman's ecological regression, King's parametric and non-parametric methods, a semi-parametric method and the homogeneous method. King's non-parametric method is then used to estimate men's and women's support for Liberal, Reform and opposition candidates and for and against prohibition from 1893 until 1919. Significant differences between men's and women's preferences are revealed by the estimates. Together these three approaches indicate that gender was an important factor in election politics of the early twentieth century.

Acknowledgements

I am very grateful to my two supervisors, Professor Miles Fairburn and Dr Irene Hudson for providing advice and support throughout the research and writing of this thesis. Professor Fairburn reminded me of the need for historical explanation when I was bogged down in statistics. Professor Fairburn was also able to provide some funding for this thesis through a Marsden Grant which was awarded for a major research project headed by Professor Fairburn and Professor Stephen Haslett, entitled 'The Social Foundation of Political Conservatism in Twentieth Century New Zealand'. Dr Hudson encouraged me to implement ecological inference, despite the challenge it entailed for this novice statistician, and patiently answered many questions on statistical detail. Comments from both supervisors improved both the historical and statistical aspects of this thesis and it is a tribute to them both that they ably supervised a thesis that bridged the two disciplines. Dr Phillipa Mein Smith and Mr Graeme Dunstall very kindly read chapters from this thesis, in the midst of their busy schedules, providing useful comments and encouragement.

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Other researchers have allowed me to cite unpublished work. Liz Gordon generously sent me a copy of her unfinished history of women in the Labour Party, "A Place in the Sun", Melanie Nolan sent me the text of her now published article "Gender and the Politics of Keeping Left", and Christina Wolbrecht, Associate Professor of Political Science at the University of

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[1] Eric J. Beh, 'Ecological Inference: A Discussion [Seminar Presentation],' (University of Canterbury: July 2003); Eric J. Beh, 'Ecological Inference: The Homogeneous Approach [Seminar Presentation],' (University of Canterbury: July 2003); David G. Steel, Eric J. Beh, and R. L. Chambers, 'The Information in Aggregate Data.' (To Appear in King, Gary, Ori Rosen and M. Tanner, Eds., *Ecological Inference: New Methodological Strategies*, Cambridge: Cambridge University Press, 2004, pp.51-68) (2002).

Notre Dame, permitted me to cite a number of working papers that consider estimates of men's and women's voting behaviour at United States elections.[2] I am also grateful to Mrs Ruth Fry who permitted me to consult the research papers she collected in the process of writing *Maud and Amber*, a biography of Maud Pember Reeves and her daughter Amber.[3]

I was glad to have the collegiality of the 'Marsden Group' in the early stages of this thesis. Thanks to Steve, Steve, John, Michael, Seren and Lydia.

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My final thanks go to Marcus, who had to put up with this thesis on a daily basis while I worked on it part-time over a number of years. Your support and encouragement were more than I could ever have expected. Thank you.

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[2] Liz Gordon, 'A Place in the Sun: Women in the New Zealand Labour Party' (1988), Unpublished manuscript; Melanie Nolan, 'Gender and the Politics of Keeping Left: Wellington Labour Women and Their Community, 1912-1949,' in *Communities of Women: Historical Perspectives*, eds., Barbara Brookes and Dorothy Page (Dunedin: University of Otago Press, 2002); Christina Wolbrecht and J. Kevin Corder, *Gender and the Vote (*Paper Prepared for Delivery at the 1999 Annual Meeting of the American Political Science Association, Atlanta, 2-5 September*)* (1999, accessed 24 June 2002); available from unix.cc.wmich.edu/~corder/apsa1999.pdf; J. Kevin Corder and Christina Wolbrecht, *Participation by New Voters: The Case of American Women* (Prepared for Sened, Itai, and Andrew Sobel, eds.,*Visualizing Politics,* December 2001) (2001, accessed 25 June 2002); available from catt.friedmann.wmich.edu/vpcw2002.pdf; J. Kevin Corder and Christina Wolbrecht, *Women's Turnout after Suffrage: New Answers to Old Questions. (*Prepared for Delivery at the 2001 Annual Meeting of the American Political Science Association, San Francisco, August 29-September 2 2001) (2001, accessed 25 June 2002); available from pro.harvard.edu/papers/117/117001WolbrechtC.pdf; J. Kevin Corder and Christina Wolbrecht, *Using Prior Information to Aid Ecological Inference: A Bayesian Approach (*Prepared for the New Advances in Ecological Inference Conference, Centre for Basic Research in the Social Sciences, Cambridge, Ma, June 2002*)* (2002, accessed 25 June 2002); available from catt.friedmann.wmich.edu/kc-cw-ei.pdf.

[3] Ruth Fry, *Maud and Amber: A New Zealand Mother and Daughter and the Women's Cause 1865 to 1981*, (Christchurch: Canterbury University Press, 1992).

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The referencing style used in this thesis is the 'Turabian Bibliography', a style based on Kate Turabian's *Manual for Writers of Term Papers, Theses and Dissertations* 6th ed. (Chicago: Chicago University Press, 1996). The referencing software *Endnote* was used throughout.

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Preface

Accounts of electoral politics in New Zealand's non-Māori electorates seldom include gender as a factor.[1] Many of these studies have focused on structural factors such as class, or the urban rural divide, and on the role of party politics.[2] The relationship between gender and electoral politics has been considered only in work on women's suffrage, and in one local study, Erik Olssen's study of the Caversham electorate, *Building the New World.*[3] Historians have largely failed to utilize a large set of quantitative data recorded with the official election results that detailed men's and women's voting rates in each electorate from 1893 until 1954.[4]

This thesis uses this data-set, and a case-study of the 1893 Christchurch election campaign to investigate the relationship between gender and voting in non-Māori electorates from 1893 to 1919, with a special focus on 1893. By combining qualitative and quantitative, local and national, this thesis bridges the sub-disciplines of gender history and the history of electoral politics. It is also cross-disciplinary, since it considers and utilises recently developed statistical techniques for ecological inference that have not previously been applied to New Zealand election data.

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[1] For further information on Māori voting see M. P. K. Sorrenson, 'A History of Maori Representation in Parliament, Appendix B, Report of the Royal Commission on the Electoral System,' in *Appendix to the Journals of the House of Representatives* (1986), with annex: 'Voting in the Maori Political Sub-System, 1935-1984' by Robert Chapman, reprint, Robert M. Chapman and Elizabeth McLeay, *New Zealand Politics and Social Patterns: Selected Works by Robert Chapman* (Wellington: Victoria University Press, 1999); and Tania Rei, *Maori Women and the Vote* (Wellington: Huia Publishers, 1993).

[2] For example Michael Bassett, *Three Party Politics in New Zealand, 1911-1931* (Auckland: Historical Publications, 1982); Robert M. Chapman, 'The Significance of the 1928 General Election: A Study in Certain Trends in New Zealand Politics in the Nineteen-Twenties' (MA Thesis, University of Auckland, 1948); Robert M. Chapman, 'The General Result,' in *New Zealand Politics in Action: The 1960 General Election*, ed. R. M. Chapman, W. K. Jackson, and A. V. Mitchell (London: Oxford University Press, 1962); Chapman and McLeay, *New Zealand Politics and Social Patterns*; David Hamer, *New Zealand Liberals: The Years of Power* (Auckland: Auckland University Press, 1988).

[3] Patricia Grimshaw, *Women's Suffrage in New Zealand* (Auckland: Auckland University Press, 1987), Chapter 10; Erik Olssen, *Building the New World: Work, Politics and Society in Caversham, 1880s-1920s* (Auckland: Auckland University Press, 1995).

[4] The exception is Caroline Daley, 'Beyond Suffrage: Gender and Voting Behaviour,' (Wellington: Suffrage Centenary Open Lecture Series Victoria University of Wellington, 1993).

The combination of a local case-study and a macro study of trends and patterns over a wider period is deliberate. I argue that local studies are critical in the study of gender and electoral politics since beliefs and understandings about gender and political preference are shaped by their interactions with the complexities of contemporary debates, local institutions and human interactions. As Erik Olssen has suggested 'Politics constitutes one arena... where social and cultural meanings are constituted'.[5] A central tenet of this thesis is that gender difference at elections is not obvious or transparent, but grounded in the language, institutions and events of electoral politics, as well as in shared understandings of gender and politics. In this way, the politics of gender interact with electoral politics.

Electoral politics covers the entire process that brings an eligible voter to cast a vote. This process includes the registration of voters, their organization into political groups and parties, the events of the campaign, the act of voting, as well as voting choices. It embraces the debates and discussions that shape and give meaning to the events of the campaign. These debates and discussions include those on matters specific to the campaign such as policy, and those with broader significance like those over the nature of politics and gender.

The term 'gender' refers to knowledges about sexual difference, and the social organization of those differences. It covers both principle and practice, and is shaped by a myriad of factors specific to time and place. As Barbara Brookes and Annabel Cooper suggest: 'Although gender difference shows consistencies across similar societies, it emerges and is changed through its interactions with the institutions, technologies, belief systems and daily practices of particular societies at particular historical moments'.[6] The same might be said of political preferences which are shaped by factors like gender, class, age, rural or urban location, party politics and the events and affiliations of election campaigns. Local studies reveal the complex connections between electoral politics and gender.

There are other reasons to favour a local study. In the late nineteenth and early twentieth century local studies are particularly appropriate because, in the absence of national party structures and a national media, local factors were very important at elections. Local studies allow historians to capture the nuance and detail of election campaigns, detail that is seldom captured in quantitative data. Local studies also provide and sharpen hypotheses for studies that cover more cases.

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[5] Olssen, *Building the New World*, p.156.

[6] Barbara Brookes, Annabel Cooper, and Robin Law, eds., *Sites of Gender: Women, Men and Modernity in Southern Dunedin, 1890-1939* (Auckland: Auckland University Press, 2003), p.vii.

Through such a local study, this thesis contributes to the historiography on women's suffrage by reconsidering the role of gender at the 1893 election. A close study of the election campaign in Christchurch allows the re-assessment of suffragists' claims about women's political preferences, and historians' claims about women's marginalization in the field of electoral politics. Newspaper accounts of the campaign suggest that, in Christchurch at least, men's and women's political opinions varied. While the male political establishment worked to limit women's participation in a number of ways, women enthusiastically entered election politics, forming new political associations. Continuity between the pre-suffrage and post-suffrage periods was evident in separation of men and women during the election campaign. This separation was more evident in organization than in policy, although politicians continued to pursue women's votes by appealing to their interest in social reforms such as prohibition.

Yet, as with gender relations, patterns and consistencies in electoral politics that are not evident in a local study can be found when considering a broader scale. Micro and macro studies answer different kinds of questions, especially in studies of electoral politics. Macro studies show trends across space and time, and allow the identification of the unusual and the typical. Macro studies effectively contextualise the local. The 'macro' part of this thesis relies on the analysis of quantitative data detailing election results. Through analysis of this data-set, this thesis contributes to both the New Zealand and international literature.

This thesis contributes to the New Zealand historiography by revising existing accounts of electoral politics. Analysis of quantitative data regarding both men's and women's turnout and their party and prohibition vote, and an analysis of the 1893 campaign suggests that gender was a significant factor in New Zealand electoral politics from 1893 until 1919. Existing accounts of electoral politics over the period have emphasized the importance of the rural-urban divide and class factors. This thesis makes it clear that gender was also a factor in electoral politics.

The consideration and use of statistical methods for ecological inference also contributes to the New Zealand historiography by providing a new methodology with which to approach questions about party and prohibition voting in the nineteenth and first half of the twentieth century. Analysts of voting in New Zealand in the period before World War II have no survey data on which to base their claims, but only official election results, which detail the votes of electorates, not individuals. Analysis of group rather than individual data is frustrated by a statistical problem known as the ecological fallacy. The ecological fallacy is the error of

extrapolating relationships measured at group level to the individual or sub-group level. Using group data to infer individual behaviour can lead to conclusions that are simply wrong. For example, New York City suburbs with high Jewish populations tended to vote Republican in the mid twentieth century. To infer that Jewish voters supported Republican candidate would be to commit the ecological fallacy. In fact, Jewish voters tended to support Democrat candidates until the 1970s, but many lived in areas where they were outnumbered by wealthy non-Jewish Republicans.[7] The voting pattern of the area hid the voting pattern of the sub-group. The same problem applies when trying to infer the behaviour of men and women from electorate-level election results which do not distinguish between men and women. Electorates with more women may have preferred a particular party, but it does not follow that women voted for that party.

Previous analysts of New Zealand election data have not taken into account the ecological fallacy and have relied on analysis of the group based data. Some analysts have, perhaps unintentionally, circumvented the ecological fallacy by focusing on the votes of entire electorates. However, use of techniques for ecological inference can provide new and rich evidence for the study of New Zealand elections. Such techniques are designed for use with group data, and utilise the information in the group data to estimate relationships at the individual and sub-group level. This thesis considers a range of methods for ecological inference, and applies one of these methods, King's non-parametric method, to estimate men's and women's party and prohibition votes from 1893 until 1919. The methodology can also be applied to questions about the relationship between voting preferences and other factors, such as voting in rural and urban electorates or the voting of different class groups.

By trialing a number of methods for ecological inference, this thesis makes a contribution to the international literature regarding techniques for ecological inference. This thesis compares two popular methods for ecological inference, Goodman's ecological regression and King's parametric method, with three little used methods. A trial using data on men's and women's turnout over a number of elections showed that King's non-parametric method, Chambers' and Steel's semi-parametric method and the homogeneous method, which has been recently proposed by Steel, Beh and Chambers, performed much better with this data set than the two most popular methods.[8] This finding has significance beyond the discipline of history, since

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[7] John Turner, 'Sex, Age and the Labour Vote in the 1920s,' in *History and Computing II*, ed. Peter Denley, Stefan Fogelvik, and Charles Harvey (Manchester: Manchester University Press, 1989), p.244.

[8] R. L. Chambers and D. G. Steel, 'Simple Methods for Ecological Inference in 2x2 Tables,' *Journal of the Royal Statistical Society Series A (Statistics in Society)* 164, no. 1 (2001); Leo A. Goodman,

methods for ecological inference are also used in many other disciplines including political science, geography and epidemiology.

The nature of this thesis has been shaped by its relationship with a larger research project, entitled 'The Social Foundation of Political Conservatism in Twentieth Century New Zealand' and supported by the Marsden Fund. The study, under the direction of Professors Miles Fairburn and Stephen Haslett, aimed to investigate the importance of structural factors like occupation, neighbourhood, religion and gender in the electoral success of mainstream conservative political parties in New Zealand. The project hoped to integrate social history with electoral politics, to ask new questions about electoral politics and to employ novel methods and techniques.[9] The study of the 1893 election campaign traverses social history by examining how Christchurch residents participated in the that campaign, but this thesis concentrates on the last two of the three aims. It examines the role of gender and gender difference in electoral politics, a factor previously been ignored by most historians of the electoral politics in the early twentieth century, and uses a new technique, ecological inference, to answer that question.

The first chapter of this thesis is an introductory one that provides a historiographical introduction to the question of gender and voting. It reviews the categories and methodologies of gender history and the history of electoral politics, and considers historians' claims about gender and voting in New Zealand. This chapter also describes the quantitative sources used in this thesis and provides an introduction to the ecological fallacy and the problem of ecological inference. Chapter Two is a case-study of the 1893 election campaign in Christchurch based on qualitative data. The remainder of this thesis considers the quantitative data. Discussion of the nature of that data in Chapter Three places the data in the context of political debates that shaped both the recording of election results and wider election politics. Analysis of the quantitative data on participation rates also in Chapter Three indicates that

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'Ecological Regression and the Behavior of Individuals,' *American Sociological Review* 18, no. 6 (1953); Gary King, *A Solution to the Ecological Inference Problem: Reconstructing Individual Behavior from Aggregate Data* (Princeton, New Jersey: Princeton University Press, 1997); David G. Steel, Eric J. Beh, and R. L. Chambers, 'The Information in Aggregate Data.' (To Appear in King, Gary, Ori Rosen and M. Tanner, Eds., *Ecological Inference: New Methodological Strategies*, Cambridge: Cambridge University Press, 2004, pp.51-68) (2002).

[9] For further information see Miles Fairburn and Stephen Haslett, 'The Social Foundations of Political Conservatism in New Zealand: Research Proposal 98-Voc-001,' (1998); *University of Canterbury History Department Current Marsden Grants*, [web page] (2003, accessed 6 January 2003); http://www.hist.canterbury.ac.nz/research/index.htm.

gender differences existed across time and space, though these differences diminished over time. Chapter Four is a prelude to the estimation of men's and women's party and prohibition votes. In that chapter a variety of techniques for ecological inference are reviewed. These techniques are Goodman's ecological regression, King's parametric and non-parametric methods, Chambers and Steel's semi-parametric approach and the homogenous method. The results of an empirical trial of these methods are reported in this chapter. Chapter Five presents estimates of men's and women's party votes and suggests points at which further research into local election campaigns might further our understandings of the connections between gender and election politics. The thesis ends with a conclusion.

Chapter 1

Bridging Histories of Gender and Electoral Politics: Methodologies and Literature Review

> **To Women Voters**
> On the eve of a General Election, when party feeling runs high, it is not easy to speak of the special duties of women in connection with politics, without being accused of partisanship... [W]e would ask you for the moment to lay aside the remembrance that you are a Conservative or a Liberal, and feel and think that you are just women – that the vote is
>
> **A Sacred Possession**
>
> specially entrusted to you for the protection and welfare of your sex, your homes, and the moral benefit of the community at large... [W]e as women, should not forget that, in taking counsel with our male friends, we should also influence them, or else the saving value and power of
>
> **Woman's Share in Politics**
>
> will be utterly lost – our talent hidden in a napkin, instead of being used to advantage.[1]

So the leading campaigner for women's suffrage, Kate Sheppard, addressed readers of the *Prohibitionist* two weeks before the general election of 1893. This was the first general election at which New Zealand women could cast a vote, and its lead-up saw a great deal of uncertainty over women's place in the election campaign and how, or indeed if, new woman voters would cast their vote. Newspapers columnists speculated, women organized and candidates orated. As the campaign progressed, it became clear that some women at least were enthusiastic about electoral politics, but even once the votes were counted, the question of how women and men voted remained unanswered.

The uncertainty occurred in the context of widespread debate over gender roles. Definitions of the ideals of manhood and womanhood and the place of men and women in politics and society had been propounded and contested as the debate over women's suffrage raged, although the emphasis was weighted towards discussion of women's roles. The passage of women's suffrage in September 1893 did not halt the debate which continued in the lead-up to the election. In Christchurch, public debates explored the place of the 'manly man' and the 'womanly woman'. Arthur Worthington, a rather controversial Christchurch evangelical, gave an elaborate lecture on 'Woman's Hour', the text of which was printed in the *Press* in full.

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[1] Kate Sheppard, 'To Women Voters,' *Prohibitionist*, 21 October 1893; reprint, *The Woman Question: Writings by the Women Who Won the Vote*, ed. Margaret Lovell-Smith (Auckland: New Women's Press, 1992), pp.93-96.

One election candidate and regular public speaker, W.W. Collins, discussed 'The rights and duties of women' to a large audience at the Lyceum. Other presentations included the Reverend C. E. Beecroft on 'Christian Manliness' and Mrs Burn on the 'Womanly Woman'.[2] Gender roles were also discussed in the suffrage literature, newspaper columns and in the parliamentary debates over women's suffrage. Advertisers tried to capitalise on the interest, publishing advertisements like the following, which appeared amongst advertisements for shoes, bicycles, furniture and other brands of tea.

> The Ideal Woman of every man is the womanly woman. The ideal man of every woman is the manly man. The ideal tea of both is the Matchless Brand.
>
> LADIES' POLLING BOOTHS are to be provided at the next general election. 'Another victory' CEYLINDO TEAS within the reach of all.[3]

Debate extended to disagreement over terms of reference. Male election candidates addressed the 'ladies', and 'ladies' committees' joined their campaign teams. Official election results referred to 'males', 'females' and 'women'. Most writers referred to 'woman' when they entered the debate over suffrage and women's role, a debate they labeled 'the woman question'. Many women seemed to have preferred 'woman' to 'lady'. A correspondent to the *Lyttelton Times* in 1893 criticized one election candidate for not calling 'a spade a spade'.

> The women of New Zealand are quite satisfied to be addressed as women. It is an insult to our intelligence for him to try and catch our votes by addressing us as ladies. Is it true he is afraid to address a meeting of women only owing to his known hostility to woman's franchise?[4]

The term 'lady' invoked ladies of leisure, with 'wasp-like waists' and 'attenuated handwriting',[5] an ideal of femininity that suffragists wished to reject, promoting instead the idea of a useful social function for women, based on their reproductive role, but not limited by it.[6] Voting was one way to fulfill that function.

The nuances and detail of such debates are the subject of histories of gender, where researchers investigate the construction and implementation of gender difference. They are seldom included in voting studies, which, if they consider gender at all, tend to focus on broad

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[2] *Press*, 25 September 1893, p.6; 7 October 1893, pp.2, 8.

[3] Capitals as in original. *Press*, 25 September 1893, p.6; 26 September 1893, p.6.

[4] *Lyttelton Times*, 31 October 1893, p.2.

[5] Kate Sheppard, 'The Electoral Bill,' Women's Christian Temperance Union page. *Prohibitionist*, 9 September 1893; reprint, *The Woman Question*, ed. Margaret Lovell-Smith, pp.87-88.

[6] Carol Lee Bacchi, *Same Difference: Feminism and Sexual Difference* (Sydney: Allen and Unwin, 1990), p.6.

patterns and trends that are evident over time and space. This thesis faces the challenge of bridging these two fields of enquiry to integrate the nuance and detail of the construction of gender difference with a study of the trends in men's and women's voting behaviour. This chapter begins by considering the insights and methodologies of the fields of gender history and the history of voting and electoral politics before turning to the literature surrounding women's suffrage. In the discussion of this literature, a number of hypotheses regarding men's and women's relationships with electoral politics are proposed. The next section of this chapter outlines the nature and scope of the available quantitative data describing men's and women's voting patterns in the late nineteenth and early twentieth century. In the final section, the problem of the ecological fallacy is discussed and the nature of methods for ecological inference traversed. These methods go some way to integrating local variation and detail with the identification of trends and patterns that exist over time and space.

Women, Gender and Gender Difference

Whereas nineteenth century feminists linked sex with social function, in the early twenty-first century, academics tend to separate biological sex from men's and women's social and cultural roles. The term 'gender' refers to the ways that sexual difference is understood in particular times and places and the ways that relationships between men and women are organized. It is frequently used in place of the word 'sex' to emphasize that the meaning of sexual difference is not constant or immutable, but specific to culture, time and place. However, as Joan Scott has pointed out, the difference is not clear cut, since the definition of gender is based on underlying sexual difference. Despite this, the separation of sex from gender has enhanced out understanding of the past since it has led to investigations of how, in Scott's words, 'sexual difference is itself articulated as a principle and practice of social organization'.[7]

What has become known as gender history grew out of women's history. Women's history aimed to recover lost 'herstory' since the experiences of women had been neglected in many accounts of the past. Women's history expanded knowledge of the past by not only adding women to existing accounts, but opening up new areas of enquiry such as the history of the family and sexuality. Such research led to the realisation that the identities and roles of men were also shaped by understandings about gender roles, and historians began to use the term

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[7] Joan Wallach Scott, 'Some Reflections on Gender and Politics,' in *Revisioning Gender*, ed. Myra Max Feree, Judith Lorber, and Beth B. Hess (Thousand Oaks, California: Sage Publications, 1999), pp.71-73,79.

'gender'. This term highlighted the fact that both men and women were gendered, leading to studies of masculinities and studies that used gender as a relational concept, examining the relationships between men and women. [8]

Despite the fact the gender history arose as a result of perceived weaknesses in women's history, women's history and the different strands of gender history often go hand in hand, as Barbara Brookes and her colleagues on the Caversham project have pointed out. Information on women can be difficult to retrieve from historical sources, and before attempting a study of both genders, historians need to recover the history of women.[9]

The idea of 'gender' as knowledges or understandings of sexual difference also allowed for the possibility of varying constructions of 'genders' across time and space, and within a particular moment. Denise Riley suggested of the category 'women':

> '[W]omen' is historically, discursively constructed, and always relatively to other categories which themselves change; 'women' is a volatile collectivity in which female persons can be very differently positioned, so that the apparent continuity of the subject 'women' isn't to be relied on; women is both synchronically and diachronically erratic as a collectivity.[10]

Historians began to consider differences amongst men and amongst women. Gender history turned away from broad historical sweeps and the re-consideration of epochs and temporalities, to what Catherine Hall has called 'a more nuanced and dense grasp of particular historical moments.'[11]

Interest in the construction of gender and gender difference at particular instances was intensified by the work of Joan Scott. Scott's contribution has been to argue that gender difference was not only a 'practice of social organization', but a principle, signifying

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[8] Barbara Brookes, Annabel Cooper, and Robin Law, 'Situating Gender,' in *Sites of Gender: Women, Men and Modernity in Southern Dunedin, 1890-1939*, ed. Barbara Brookes, Annabel Cooper, and Robin Law (Auckland: Auckland University Press, 2003); Caroline Daley and Deborah Montgomerie. 'Introduction.' In *The Gendered Kiwi*, ed. Caroline Daley and Deborah Montgomerie (Auckland: Auckland University Press, 1999); Catherine Hall, *White, Male and Middle Class: Explorations in Feminism and History* (New York: Routledge, 1992), pp.5-18; Joan Wallach Scott, 'Gender: A Useful Category of Historical Analysis,' in *Gender and the Politics of History* (New York: Columbia University Press, 1988).

[9] Brookes, Cooper, and Law, 'Situating Gender,' p.6.

[10] Denise Riley, *'Am I That Name?' Feminism and the Category of 'Women' in History* (Minneapolis: University of Minnesota, 1988), pp.1-2.

[11] Hall, *White, Male and Middle Class*, p.7.

relationships of power and structuring meanings. Scott emphasized the importance of questions about how sex, gender and sexual difference were constituted, implemented and invoked, not merely how they manifested, thereby shifting attention to the way that gender threaded through the past as a symbolic construct.[12] Some historians have disagreed with Scott's perspective, arguing that she places too much emphasis on language, and not enough on the necessary relationship between language and the real world.[13] However, her attention to the construction of meaning and relationships of power has been very influential. In particular, it has led to greater examination of subjective identity, social relationships and symbolic representations of power and meaning. New Zealand work explicitly influenced by Scott includes local studies such as *Sites of Gender* which considers men and women in Dunedin between 1890 and 1919, and Caroline Daley's study of gender in Taradale, *Girls and Women, Men and Boys*, and the collection of essays *The Gendered Kiwi.*[14]

Scott's emphasis on the importance of language and social relationship is crucial to the understanding of the relationship between gender and politics used here. This thesis argues that politics was criss-crossed by gender and gender difference which underlay both political organization and political language. Moreover, definitions of gender difference are themselves created, contested and expressed in the sphere of electoral politics. Election outcomes cannot be separated from election politics and wider debates where political constituencies were created and the relationship between gender and politics articulated.

Iris Marion Young has suggested that this kind of approach avoids the trap of naturalizing difference between men and women and ignoring differences amongst them. Using Sartre's notion of 'seriality', Young suggests that women, and by extension, men, can be viewed as series, or 'passive unities', able to be, but not necessarily, mobilized into self-conscious,

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[12] Scott's most important article was Scott, 'Gender: A Useful Category of Historical Analysis.' Other essays by Scott appear in *Gender and the Politics of History*. See also Joan Wallach Scott, ''Experience',' in *Feminists Theorise the Political*, ed. Judith Butler and Joan Scott (New York and London: Routledge, 1992); Scott, 'Some Reflections on Gender and Politics.'

[13] For a local example, see Erik Olssen, *Building the New World: Work, Politics and Society in Caversham, 1880s-1920s* (Auckland: Auckland University Press, 1995), pp.12-13.

[14] Brookes, Cooper, and Law, eds., *Sites of Gender*; Caroline Daley, *Girls and Women, Men and Boys: Gender in Taradale 1886-1930* (Auckland: Auckland University Press, 1999); Daley and Montgomerie, eds., *The Gendered Kiwi*.

politicized groups.[15] The extent and nature of this mobilisation is created and expressed through electoral politics, social debates, and organization.

This conception allows for political mobilisation of men as men and women as women, or what might be called a separate spheres or gender culture model. Sheppard's call to women voters to 'feel and think you are just women' indicates that she hoped that women could promote a women's platform through their votes. However, Sheppard also realised that women held differing partisan opinions. The idea that 'passive unities' can be mobilised into self-conscious groups allows for the possibility that some men and some women can be mobilised to form a group based on their gender as well as on other factors such as class, religion or a shared interest in prohibition. In other words, this conception allows that gender can be the warp to the weft of political identity. Gender can interact with other factors to shape political behaviour and preference.[16]

The History of Electoral Politics

Traditionally, studies of voting have not focused on the formation of coherent political identities through the language and organization of local electoral politics, but have instead focused on the larger scale. Many studies have suggested that voting patterns are based on social structures and individuals' membership of social groups. The emphasis on structure reflects the methodology that has dominated the field. The introduction of survey techniques in the 1950s and 1960s encouraged the use of quantitative methods in studies of elections. Although studies of election politics have bridged quantitative and qualitative approaches, it has been quantitative methods that have highly influenced the field. Psephology, the scientific study of elections, became associated with the quantitative analysis of survey data where individuals' membership of various social groups was easily quantified.[17]

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[15] Iris Marion Young, 'Gender as Seriality: Thinking About Women as a Social Collective,' in *Social Postmodernism: Beyond Identity and Politics*, ed. Linda Nicholson and Steven Seidman (Cambridge: Cambridge University Press, 1995), p.188. See also Sue Tolleson Rinehart, *Gender Consciouness and Politics* (New York: Routledge, 1992) who discusses the importance of gender consciousness in politics.

[16] So that for example, men's and women's responses to the 1890 Maritime Strike were shaped by class and gender. Bruce Scates, 'Mobilising Manhood: Gender and the Great Strike in Australia and Aotearoa/New Zealand,' *Gender and History* 9, no. 2 (1997).

[17] Jon Lawrence and Miles Taylor, 'Introduction: Electoral Sociology and the Historians,' in *Party, State and Society: Electoral Behaviour in Britain since 1820*, ed. Jon Lawrence and Miles Taylor (Aldershot, Hants.: Scolar Press, 1997).

Within the field of New Zealand history, the study of electoral politics has been dominated by Robert Chapman who applied the insights and assumptions of psephology to historical elections. Chapman argued that electoral politics reflected sectional interests created by social and economic conditions, linking electoral history with social structure and social attitudes. A party's success at election time depended on its ability to appeal to sectional interests. These interests were not merely economic, but reflected different approaches to social questions and delineated 'different psychologies arising from two sorts of experience of life'.[18] Chapman based his claim on an analysis of official election results rather than survey data. His technique was to divide the electorates into what he called sectional groups. Although the details of this categorization shifted slightly over his career, it was based on dividing rural from urban, with mixed categories in between. Urban electorates were further categorized according to their tendency to vote left or right, a tendency which Chapman took to reflect wealth and status. Chapman claimed that the major cleavage in New Zealand politics was the rural-urban split. He showed that rural and urban electorates had preferences for different parties. Farming and rural sections were less likely to elect a Labour Member of Parliament in the mid twentieth century. Class was also a factor with the more conservative Reform Party doing better in more prosperous areas. [19]

Others have used similar categorizations to make similar conclusions. Writing at the same time as Chapman, and dividing the electorates only slightly differently, Leslie Lipson argued that the Liberals were strongest in urban areas, while Reform captured mainly rural votes.[20] Directly influenced by Chapman, Richard Newman used census data to refine the categorizations, and used them to assess support for prohibition at prohibition polls which took place in New Zealand from 1894. Newman argued that sectional interests governed support for prohibition. Early support for prohibition came from established farmers and city suburbs, but in 1911, when the vote for prohibition peaked, support came from all sections,

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[18] Robert M. Chapman, 'The General Result,' in *New Zealand Politics in Action: The 1960 General Election*, ed. R. M. Chapman, W. K. Jackson, and A. V. Mitchell (London: Oxford University Press, 1962), p.235.

[19] Chapman, 'The General Result'; Robert M. Chapman and Elizabeth McLeay, *New Zealand Politics and Social Patterns: Selected Works by Robert Chapman* (Wellington: Victoria University Press, 1999), especially 'The Response to Labour and the Question of Parallelism of Opinion, 1928-60'; Robert M. Chapman, 'The Significance of the 1928 General Election: A Study in Certain Trends in New Zealand Politics in the Nineteen-Twenties' (MA Thesis, University of Auckland, 1948).

[20] Leslie Lipson, *The Politics of Equality: New Zealand's Adventures in Democracy* (Chicago: University of Chicago Press, 1948), especially pp.204-205.

including the previously reluctant back-country and inner city electorates.[21] Other historians have noted the importance of the development of party politics in early twentieth century electoral politics, but have largely confirmed the importance of sectional voting. David Hamer found that urban communities were more likely to return a Liberal candidate from the 1890s, and that the defection of country towns from the Liberal cause contributed to Liberal decline from 1908. Michael Bassett argued that increasing urbanization changed voting patterns between 1911 and 1931, aiding the rise of the urban based Labour Party. [22]

Few of these studies considered gender. Chapman noted large advertisements encouraging women to vote Reform at the 1925 election,[23] but did not consider gender difference in voting patterns, presumably assuming that both men's and women's votes would be primarily shaped by their rural or urban identification and their relative wealth and status. Chapman's methodology does not easily lend itself to analyzing gender voting preferences since electorates had fairly even numbers of men and women and it makes little sense to categorize electorates by gender proportions since these proportions were very similar across electorates. However, Chapman did not consider how gender might have interacted with rural and urban differences. Those who have considered gender have only done so in relation to the prohibition poll. Both Newman and A. R. Grigg considered whether women were more likely to support prohibition than men, but found no evidence to support the claim.[24]

Failure to consider gender difference adequately was common in studies of electoral politics before the 1980s. In their study of British elections of the 1960s, Butler and Stokes asserted women's greater conservatism in a footnote.[25] This failure was due to a combination of lack of data, and the methodologies and assumptions about the mechanisms of voting which underlay the studies. In many cases, it has been due to the privileging of questions about class voting, and the use of measures of class based on paid work. As we shall see in Chapter

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[21] R. K. Newman, 'Liberal Policy and the Left Wing 1908-1911: A Study of Middle-Class Radicalism in New Zealand' (MA Thesis, University of Auckland, 1965), pp.397-403; Richard Newman, 'New Zealand's Vote for Prohibition in 1911,' *New Zealand Journal of History* 9, no. 1 (1975).

[22] Michael Bassett, *Three Party Politics in New Zealand, 1911-1931* (Auckland: Historical Publications, 1982); David Hamer, *New Zealand Liberals: The Years of Power* (Auckland: Auckland University Press, 1988), especially Chapter Five 'Town City and Country'.

[23] Chapman, 'The Significance of 1928', p.40.

[24] A. R. Grigg, 'Prohibition and Women: The Preservation of an Ideal and a Myth,' *New Zealand Journal of History* 17, no. 2 (1983); Newman, 'New Zealand's Vote for Prohibition.'

[25] David E. Butler and Donald Stokes, *Political Change in Britain: The Evolution of Electoral Choice*, 2nd ed. (London: McMillan Press, 1974), p.160.

Three, information about women's occupation, a commonly used variable, is lacking in the New Zealand historical data. When more information is available, such as in survey data, studies face the problem of how to classify women whose relationship with paid work may be uneven. 'Housewives' pose a particular problem. Even in recent studies, housewives are often classified by their husbands' class, or excluded altogether.[26] The conventional wisdom, primarily associated with John Goldthorpe, has been that housewives voted with their husbands, since voting is based on class, and a wife's class is based on her husband's class.[27] Notably, some studies have shown that women's occupation affects their husbands' votes, rather than the other way around, but the debate continues. New studies are indicating that the class identity of wives depends on both their own and their husband's class position.[28]

Moreover, emphasis on class obscures both the way that gender interacts with class to shape categories of class and gender and the possibility that women's political behaviour may have been determined by other factors. Since women's participation rates in paid work have been different to men's, paid occupation may not have determined their political behaviour. For many women, '*their* workplace was their home', as Marilyn Lake has suggested.[29] Feminists have argued that narrow definitions of politics privilege men's political activities, such as those based on work, and obscure women's political activities which may occur outside the 'malestream' of traditionally defined politics.[30]

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[26] Geoffrey Evans, ed., *The End of Class Politics? Class Voting in Comparative Context* (Oxford: Oxford University Press, 1999), especially p.282.

[27] John H. Goldthorpe, 'Women and Class Analysis: In Defence of the Conventional View,' *Sociology* 17 (1983); John H. Goldthorpe, 'Women and Class Analysis: A Reply to the Replies,' *Sociology* 18 (1984); Anthony Heath and Nicky Britten, 'Women's Jobs Do Make a Difference: A Reply to Goldthorpe,' *Sociology* 18 (1984); Michelle Stanworth, 'Women and Class Analysis: A Reply to John Goldthorpe,' *Sociology* 18 (1984).

[28] Nicky Britten and Anthony Heath, 'Women, Men and Social Class,' in *Gender, Class and Work*, ed. Eva Gamarnikow, David H. J. Morgan, June Purvis, and Daphne Taylorson (London: Heinemann, 1983); Michael E. Sobel and others, 'Men Matter More: The Social Class Identity of Married British Women, 1985-1991,' *Journal of the Royal Statistical Society Series A (Statistics in Society)* 167, no. 1 (2004).

[29] Marilyn Lake, 'The Politics of Respectability: Identifying the Masculinist Context,' in *Debutante Nation: Feminism Contests the 1890s*, ed. Susan Magarey, Sue Rowley, and Susan Sheridan (St Leonards, New South Wales: Allen and Unwin, 1993), p.11.

[30] Janet A. Flammang, *Women's Political Voice: How Women Are Transforming the Practice and Study of Politics* (Philadelphia: Temple University Press, 1997); Nicky Hart, 'Gender and the Rise and Fall of

In fact, when gender is considered in psephelogical studies, the international literature suggests that men's and women's voting patterns have differed, and show broad patterns over time and space. Most of these studies are based on survey data, and hence do not consider the period prior to World War II. Most studies have shown that women's participation in electoral politics generally has been lower than men's. There is also some evidence that the spectrum of men's and women's attitudes may fall on different continuums. Janet Flammang has suggested that while men's votes may fall on the conventional liberal-conservative continuum, women's votes range from 'compassionate' to 'traditional', on one side supporting access to health, education and welfare, and on the other emphasizing the home, religion and law and order. Differences have been attributed to women's and men's different socialization and different relationships to the social and economic spheres. Most studies suggest that as women have become integrated into the public sphere, differences have diminished, but other studies suggest that gender differences have become more rather than less important.[31] A New Zealand study of survey data from the New Zealand general elections of 1963, 1981 and 1990 found that 'gender gaps' existed in 1963. At that election women were less likely to vote, and more likely to vote National, but differences had disappeared in 1981 and 1990. The author of the study, Jack Vowles, argued that shifts in gender relations, such as women entering the workforce in higher numbers only partly explained the shifts. Vowles argued that the disappearance of gender difference was also due to greater emphasis on issues of concern to women such as the anti-nuclear issue and the environment, but admitted that these claims were largely speculative.[32]

Many of these studies discuss men's and women's political participation generally, without focusing on the specific context of election campaigns. Recent critiques of psephology have suggested that voting patterns need to be understood in the context of elections. Psephological models are criticized for privileging structural variables in their explanatory models.

Class Politics,' *New Left Review* 175 (1989); Janet Siltanen and Michelle Stanworth, eds., *Women and the Social Sphere: A Critique of Sociology and Politics* (London: Hutchinson, 1984).

[31] Most of the literature concentrates on women's role in politics, rather than taking a gender approach. See in particular Flammang, *Women's Political Voice: How Women Are Transforming the Practice and Study of Politics*, pp.129-130; Louise A. Tilly and Patricia Gurin, 'Introduction,' in *Women, Politics and Change*, ed. Louise A. Tilly and Patricia Gurin (New York: Russell Sage Foundation, 1990). Other studies are listed in the bibliography.

[32] Jack Vowles, 'Gender and Electoral Behaviour in New Zealand: Findings from the Present and the Past,' in *Women and Politics in New Zealand*, ed. Helena Catt and Elizabeth McLeay (Wellington: Victoria University Press and *Political Science*, 1993).

Lawrence and Taylor have argued that such models assume that voters' positions are 'predetermined and self-evident, *only* requiring recognition and expression by the parties'. They suggest that psephology needs to undergo a kind of 'linguistic turn' to allow for the role of political language and organization, in particular, parties' attempts to create their own constituencies.[33] Chapman's failure to examine Reform's attempts to mobilize women voters in 1925 is a good example of this disregard of election campaigns. By ignoring political language and organization at particular times and places, accounts run the risk of naturalizing 'passive unities' such as gender, class or the rural-urban split without investigating how these categories may or may not become politically relevant.

A number of British studies of particular elections have suggested that the ways in which parties have mobilized constituencies of women or men, and their co-option of languages of masculinity or femininity, have been crucial elements in their electoral success. These studies have turned away form quantitative methods, providing narrative and descriptive accounts that trace the events and alignments of election campaigns.[34] Erik Olssen's account of electoral politics in Caversham, *Building the New World*, is an example of a New Zealand study that focuses on the progress of election campaigns, and is one of the few historical studies to consider gender in New Zealand electoral politics. The study is not explicitly about voting, but the relationship between work and politics. It is based on a large set of quantitative data listing, among other things, residents' occupations and marital status. Olssen relies on narrative or Geertzian 'thick description', rather than quantitative analysis, to explain the connections between politics and structure, particularly the organization of work, in southern Dunedin from the 1880s to the 1920s.[35]

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[33] Lawrence and Taylor, 'Introduction: Electoral Sociology and the Historians,' p.18. See also Jon Lawrence, 'Political History,' in *Writing History: Theory and Practice*, ed. Stefan Berger, Heiko Feldner, and Kevin Passmore (London: Hodder Arnold, 2003).

[34] Mary Hilson, 'Women Voters and the Rhetoric of Patriotism in the British General Election of 1918,' *Women's History Review* 10, no. 2 (2001); David Jarvis, 'The Conservative Party and the Politics of Gender, 1900-1939,' in *The Conservatives and British Society, 1880-1990*, ed. Martin Francis and Ina Zweiniger-Bargielowska (Cardiff: University of Wales Press, 1996); Amanda Vickery, ed., *Women, Privilege, and Power: British Politics, 1750 to the Present* (Stanford, California: Stanford University Press, 2001); Ina Zweiniger-Bargielowska, 'Explaining the Gender Gap: The Conservative Party and the Women's Vote, 1945-64,' in *The Conservatives and British Society 1880-1990*, ed. Martin Francis and Ina Zweiniger-Bargielowska.

[35] Olssen, *Building the New World.*

Olssen's account traces the way that work-based organizations dominated politics in Caversham over the period. Politics was dominated by men and metaphors of masculinity, as men fought to protect their 'manly independence' by promoting, among other things, the family wage. As Olssen noted '[t]he family wage produced the working man as "family man", his wife at home managing the house and looking after his children'. Ideals about the proper spheres of men and women shaped both political platforms and organization. Women were 'made marginal' to the political system that developed in Southern Dunedin because they were excluded from the categories of 'work' and 'skill' on which politics was based. Olssen argued that women were complicit in their exclusion, and must have mostly agreed with the positions articulated by men. He found little evidence that women objected to the political system that developed in Caversham.[36]

By privileging paid work, Olssen's analysis does exclude the possibility that women's political activities may have based on other factors. He notes that women suffragists' defense of the home further marginalized them from work based politics, but the politics of women's suffrage was not the focus of his study, and Olssen did not investigate the activities of suffrage organizations in Caversham. Consideration of women's political activities was hindered by what Olssen called a 'frustrating silence' in the historical record regarding such activities.[37] Research completed after Olssen's account suggested that that women in Caversham were extremely enthusiastic about women's suffrage. They certainly signed the petition for women's suffrage in large numbers, larger than in any other area of New Zealand.[38] In more recent work, Olssen has somewhat modified the conclusions made in *Building the New World*, giving women more agency. He has suggested that women's increased participation in the paid workforce prior to marriage changed the meaning of the home and of gender roles.[39] However, the relationship between the politics of women's suffrage, suffrage organization and electoral politics has not yet been fully explored.

Local accounts like Olssen's tease out the relationships between political debates, voters, parties, politicians and the polling booth. They can provide much richer accounts of the relationship between membership of a social group and political preferences than analyses

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[36] Olssen, *Building the New World*, p.157.

[37] Olssen, *Building the New World*, p.182.

[38] Kirsten Thomlinson, 'We the Undersigned: An Analysis of Signatories to the 1893 Women's Suffrage Petition from Southern Dunedin' (MA Thesis, University of Otago, 2001).

[39] Erik Olssen, 'Working Gender, Gendering Work,' in *Sites of Gender*, ed. Barbara Brookes, Annabel Cooper, and Robin Law.

based merely on survey data. Local accounts that detail the nuance and texture of electoral politics can be set against psephelogical accounts that focus on broad trends, group voting and quantitative measures. Critics of psephology admit that accounts of electoral politics have not been totally absent from psephelogical studies.[40] However, there is a need to contextualize voting patterns by placing them in the context of electoral politics and debates. This does not sit easily with quantitative studies of voting which look for broad trends and patterns. As Miles Fairburn has noted quantitative analysis can be deterministic, assuming the power of structures and diminishing the role of the local.[41] How can electoral campaigns be measured? Can the complexities of individual voting preferences be balanced with group patterns? These questions suggest that quantitative studies are far richer when combined with attention to local detail. Detailed studies of elections can also provide hypotheses for more wide-ranging quantitative studies.

This study covers a broad time period, 1893 to 1919, and it would be ideal to examine a number of election campaigns to illuminate quantitative data. That would entail a quantity of research beyond the bounds of this thesis. Hence this thesis considers one election campaign, that of 1893 in Christchurch. Christchurch was chosen for study because of availability of sources, and because it was home to a number of suffrage activists like Kate Sheppard and Maud Reeves, wife of the Christchurch Member of the House of Representatives, William Pember Reeves.

1893, Women's Suffrage and Politics in New Zealand

The general election of 1893 is an obvious choice for the study of the relationship between gender and voting because it coincides with and continues major debates over gender roles generated by the campaign for women's suffrage. The suffrage movement had politicized the category of women. Did the mobilization of the 'passive unity' of women in support of the suffrage campaign carry across into electoral politics?

Accounts of electoral politics in the 1890s tend to focus on the role of the developing Liberal party. Prior to the 1890s party affiliations had been only loose, and the formation of the Liberal party, and its success at the 1890 election, signaled a change in the nature of electoral politics. The rise of the Liberal party coincided with the rise of workers' groups, and the

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[40] Lawrence and Taylor, 'Introduction: Electoral Sociology and the Historians,' p.18.

[41] Miles Fairburn, *Social History: Problems, Strategies and Methods* (Houndsmills, Basingstoke: MacMillan Press, 1999), pp.157-160.

development of party government has been linked with the rise of sectional interests based on class and rural or urban location.[42] Accounts of party politics have generally not examined the role of gender in political alignments, although Olssen's work is a notable exception. Analyses of the connection between politics and gender can, however, be found in the literature about the women's suffrage campaign. A review of this literature suggests a number of questions and hypotheses about gender and electoral politics. These hypotheses refer to the role of gender in the organization and debates of election campaigns, the role of gender in voting patterns and the connection between voting and election campaigns.

There have been three main debates in the historiography on women's suffrage. The first was over the winning of women's suffrage: was it a gift from men or a struggle by women? This debate encompasses the themes of structure and agency and questions the locus of political power. Historians have also debated the basis of women's claims for the suffrage. Some have argued that suffragists' claims to the vote were based on the ideal of a 'New Woman', who was moving outside the home to seize work and educational opportunities, and who was entitled to the vote on the basis of equality. Others have suggested that the ideal of the 'colonial helpmeet' was more important, with suffragists' claims based on women's special responsibility for the home and moral and social issues. Finally, there has been debate over the effects of suffrage. Kate Sheppard argued that suffrage led to more welfare legislation, but recent accounts have claimed that women were further marginalized in the sphere of politics through the invocation of gender difference.

It was William Pember Reeves who set the tone for the debate over the winning of women's suffrage. Reeves claimed that women's suffrage was a gift:

> So, one fine morning of September 1893, the women of New Zealand woke up and found themselves enfranchised. The privilege was theirs – given freely and spontaneously, in the easiest and most unexpected manner in the world, by male politicians...[43]

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[42] Hamer, *The New Zealand Liberals;* Len Richardson, 'Parties and Political Change,' in *Oxford History of New Zealand*, ed. Geoffrey W. Rice (Auckland: Oxford University Press, 1992); Keith Sinclair, *A History of New Zealand*, Revised and enlarged ed. (Auckland: Penguin Books, 1980), pp.170-171.

[43] William Pember Reeves, *State Experiments in Australia and New Zealand,* Volume I (London: George Allen and Unwin, 1923), p.112.

Kate Sheppard immediately responded to Reeves' account by stressing the struggle by women suffragists,[44] and Sheppard's view was confirmed by Patricia Grimshaw who placed the New Zealand women's suffrage campaign in the context of a wider international feminist movement. Grimshaw also noted that public support of the measure was vital in encouraging politicians to introduce the measure in parliament. [45] However, Jean Garner has more recently insisted that the role of the suffragists' most important parliamentary supporter, Sir John Hall, has been downplayed. [46] Like many debates, the truth seems to be in the middle. Suffrage was both gift and struggle. Women suffragists fought for the vote, but they were ultimately reliant on men in parliament to promote and pass the measure.

Grimshaw's account of the women's suffrage movement emphasized the role of the New Woman. While some commentators ridiculed her bicycle-riding and divided skirts, the appearance of the New Woman reflected changes in women's occupational and educational opportunities, as women engaged in higher education and paid work outside the home. These changes led to shifts in attitudes and there were calls for a number of social reforms including dress reform, changes in divorce and property laws, and agitation for women's suffrage.[47] However, Raewyn Dalziel had earlier suggested that calls for suffrage arose instead from a belief that women's vital role was as colonial helpmeets, 'homemakers and guardians of moral health and welfare'. Women's domestic role was seen as the basis for their special interest in social and moral issues which underlay women's claim to the suffrage. By voting, women would promote the values of the home in the political sphere, cleaning up politics.[48]

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[44] Kate Sheppard, 'Mr W.P. Reeves and Women's Franchise,' *The White Ribbon* 1903; reprint, *The Woman Question.* ed. Margaret Lovell-Smith, pp.102-104.

[45] Patricia Grimshaw, *Women's Suffrage in New Zealand* (Auckland: Auckland University Press, 1987).

[46] Jean Garner, *By His Own Merits: Sir John Hall - Pioneer, Pastoralist and Premier* (Hororata: Dryden Press, 1995); Grimshaw, *Women's Suffrage in New Zealand;* Patricia Grimshaw, 'Women's Suffrage in New Zealand Revisited: Writing from the Margins,' in *Suffrage and Beyond: International Feminist Perspectives*, ed. Caroline Daley and Melanie Nolan (Auckland: Auckland University Press, 1994); Dorothy Page, 'Introduction,' in *The Suffragists, Women Who Worked for the Vote: Essays from the Dictionary of New Zealand Biography* (Wellington: Bridget Williams Books, 1993); Sheppard, 'Mr W.P. Reeves and Women's Franchise.'

[47] Sandra Coney, *Standing in the Sunshine: A History of New Zealand Women since They Won the Vote* (Auckland: Penguin Books (NZ) Ltd, 1993), p.15; Grimshaw, *Women's Suffrage in New Zealand,* especially Chapter One. The 'New Woman' also features in the articles in *Sites of Gender*, ed. Barbara Brookes, Annabel Cooper, and Robin Law.

[48] Raewyn Dalziel, 'The Colonial Helpmeet: Women's Role and the Vote in Nineteenth-Century New Zealand,' *New Zealand Journal of History* 11, no. 2 (1977): p.113.

As Donald Denoon and Philippa Mein-Smith have suggested the lines were not so clearly drawn. Kate Sheppard herself epitomized both the New Woman and colonial helpmeet,[49] with her ideal woman working for 'self-evolution, for the strengthening of domestic ties, for the performance of national duties, and for the betterment of humanity generally'. [50]

The polarities of New Woman and colonial helpmeet do reflect the two main strands of the suffragist literature. Claims for suffrage were made on the basis of both equality and difference. Difference was evident in arguments that stressed women's interest in social and moral issues, and linked the suffrage campaign with the campaign for temperance. Many suffragists did promote temperance, and argued for the vote for 'the protection of herself and her children'.[51] Indeed, the women's temperance organization, the Women's Christian Temperance Union, was an active player in the campaign for suffrage. However, campaign material produced by the suffrage movement placed at least as much emphasis on arguments based on equality. 'Sixteen Reasons for Supporting Women's Suffrage' listed the following grounds for women's suffrage at the head of its list of sixteen:

> 1. Because it is the foundation of all political liberty that those who obey the law should be able to have a voice in choosing those who make the law.
> 2. Because Parliament should be the reflection of the wishes of the people.
> 3. Because Parliament cannot fully reflect the wishes of the people, when the wishes of women are without any direct representation.
> 4. Because a Government of the people, by the people, and for the people, should mean all the people, and not one half.[52]

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[49] Donald Denoon, Philippa Mein-Smith, and Marjorie Wyndham, *A History of Australia, New Zealand and the Pacific* (Oxford: Blackwell, 2000), p.208. Olssen and Nolan make similar points. Melanie Nolan, *Breadwinning: New Zealand Women and the State* (Christchurch: Canterbury University Press, 2000), p.58; Olssen, 'Working Gender.'

[50] Kate Sheppard, 'Ideals of Womanhood,' *Prohibitionist*, 3 December 1892; reprint, *The Woman Question*, ed. Margaret Lovell-Smith, p.105-106.

[51] [An Unknown Reporter], 'A Chat with the Franchise Superintendent of the W.C.T.U.,' *Prohibitionist* 7 October 1893; reprint, *The Woman Question*, ed. Margaret Lovell-Smith, pp.88-93. The link between temperance, suffrage and gender is further explored in Phillida Bunkle, 'The Origins of the Women's Movement in New Zealand: The Women's Christian Temperance Union 1885-1895,' in *Women in New Zealand Society*, ed. Phillida Bunkle and Beryl Hughes (Auckland: George Allen and Unwin, 1980); Sarah Dalton, 'The Pure in Heart: The New Zealand Women's Christian Temperance Union and Social Purity, 1885-1930' (MA Thesis, Victoria University of Wellington, 1993); Jock Phillips, *A Man's Country? The Image of the Pakeha Male*, Revised ed. (Auckland: Penguin Books (NZ) Ltd, 1996).

[52] 'Sixteen Reasons for Supporting Women's Suffrage,' *Prohibitionist*, 7 November 1891, p.3; reprint, *The Vote, the Pill and the Demon Drink: A History of Feminist Writing in New Zealand, 1869-1993*, ed. Charlotte Macdonald (Wellington: Bridget Williams Books, 1993) pp.41-42. Similar points were

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made in Kate Sheppard, 'Is It Right?,' *Prohibit*
ed. Margaret Lovell-Smith, pp.83-84.

[53] Reeves, *State Experiments*, pp.139-140; Will
Cloud Ao Tea Roa, 3 ed. (Twickenham: Senate
Women's Franchise,' p.103.

[54] Grigg, 'Prohibition and Women.'

[55] Grimshaw, *Women's Suffrage in New Zealan*
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Melanie Nolan.

[56] Olssen, *Building the New World,* p.157.

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, p.313; Sheppard, 'Mr W.P. Reeves and

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Suffrage and Beyond, ed. Caroline Daley and

suffrage as the showcase of the nation. Women's suffrage became a signifier of national progress rather than the herald of greater political power and influence for women.[57] Melanie Nolan's work suggests that these arguments are too strong. Nolan found that government policy preserved women's association with the home by supporting the rights of the male breadwinner and his family. However, state policy also encouraged women's increased participation in the workforce. Politicians both emphasised women's association with the home, and undermined it, by protecting women in paid work.[58]

These debates suggest a number of questions for a study of the relationship between gender and electoral politics from 1893. The debate over gift or struggle raises further questions about the power of women's organizations and individual women. What was their relationship with the established structures of electoral politics? How did women enter into electoral politics, an arena from which they had been previously excluded, bearing in mind that women could not yet stand for parliament? Did women's groups integrate with established structures or stay separate? Where was the locus of power in political organization and in policy formation? The debate over New Woman versus colonial helpmeet suggests questions about gender difference and its relationship with positions on the political spectrum. How was gender and gender difference invoked in election campaigns? Were men's and women's similarities and shared interests also invoked? Was equality important? Was gender difference a factor in voting choices? The marginalization thesis raises questions about the political strategies of women and men. Were women marginalized or merely separate? Did women's participation in politics equal men's? Were women complicit in promoting their connection with the home which led to their differentiation? Were 'women' or 'men' coherent political entities? The questions suggest examining political organization, language and voting patterns.

Political Organization and Participation

Prior to the winning of suffrage, women's political activities were largely separate from men's, and located outside the male dominated spheres of parliamentary and electoral politics. Some women were not shy of trying to influence those arenas either individually or through organizational work. Moreover, women's political activities were often designed to

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[57] Raewyn Dalziel, 'An Experiment in the Social Laboratory? Suffrage, National Identity and the Mythologies of Race in New Zealand in the 1890s,' in *Women's Suffrage in the British Empire: Citizenship, Nation and Race*, ed. Ian Christopher Fletcher, Laura E. Nym Mayhall, and Philippa Levine (London: Routledge, 2000), especially p.98.

[58] Nolan, *Breadwinning*, especially pp.60-64.

break down the barriers that prevented women from voting and standing for parliament.[59] Both individual women and women's organizations were active. Politicians' wives influenced and networked. Maud Reeves, wife of the Christchurch Member of the House of Representatives, William Pember Reeves, actively supported her husband's career, canvassed for his election, and influenced his opinions, famously assuring Sir John Hall that William was 'to be relied upon' to vote for women's suffrage. 'I have seen to that', Maud claimed.[60]

Suffragists also agitated as individuals. At an early stage Mary Muller produced a number of pamphlets and newspaper articles promoting suffrage under the pen-name 'Femmina'[61] Others like Muller and Kate Sheppard wrote letters, appealed to politicians, attended parliamentary debates and addressed meetings on topics such as suffrage and social reform.

Women's political organizations were extremely active. The majority of women's political activities took place under the umbrella of organizations for women like the Women's Christian Temperance Union (WCTU), active in the campaign for social reform including temperance. Franchise Leagues were also established throughout the country, to provide a vehicle for suffragists who did not support temperance. Christchurch was home to the Canterbury Women's Institute, one of the few feminist organizations to allow men as members. Activities included organizing meetings, and canvassing for signatures to petitions in support of suffrage. Members of such groups also ran classes, held discussions, read and wrote papers, passed resolutions, and held meetings.[62] Other women joined workers' unions such as the Dunedin Tailoresses' Union where women used similar techniques to gain better representation and conditions in the workplace.[63]

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[59] The importance of petitioning in asserting the political rights of United States women has been traced in Susan Zaeske, *Signatures of Citizenship: Petitioning, Antislavery and Women's Political Identity* (Chapel Hill and London: University of North Carolina Press, 2003).

[60] Undated letter, Maud Reeves to Sir John Hall, Sir John Hall Papers, quoted in Ruth Fry, 'Maud Pember Reeves' in Charlotte Macdonald, Merimeri Penfold, and Bridget Williams, eds., *Book of New Zealand Women Ko Kui Ma Te Kaupapa* (Wellington: Bridget Williams Books, 1991), p.508.

[61] Mary Muller, 'An Appeal to the Men of New Zealand,' in *The Woman Question*, ed. Margaret Lovell-Smith.

[62] Raewyn Dalziel, 'Political Organisations,' in *Women Together: A History of Women's Organisations in New Zealand Nga Ropu Wahine O Te Motu*, ed. Anne Else (Wellington: Historical Branch, Department of Internal Affairs and Daphne Brasell Associates Press, 1993). See also the biographies of the various political organizations which follow Dalziel's introduction.

[63] Melanie Nolan and Penelope Harper, 'Dunedin Tailoresses Union, 1889-1945,' in *Women Together*, ed. Anne Else.

Women's previous exclusion from electoral politics had united them outside electoral politics. The existence of women's political groups also united women organizationally. Separate organization may have been forced upon women by notions about separate spheres for men and women, embodied in legislation that excluded women form the vote. Some suffrage organizations were mixed, but, as Sir John Hall noted, women showed a marked preference for political organizations led by women.[64] This preference for separate organizations also embodied the idea of a separate women's culture, nurturing and confirming notions of differences between men and women in the political sphere. This suggests that women's separate organization, or otherwise, might play a vital part in the electoral mobilization of women.

It was not clear what role women's suffrage groups would have after suffrage was won. Grimshaw found that there was disagreement amongst suffragists over whether it was better to work through non-party organizations or through the established political parties.[65] Many of the non-party organizations were women's groups, whereas the political parties were part of the political establishment, and were dominated by men. Historians have not investigated the impact of women's groups on electoral politics, nor the role of women in political parties in the 1890s.[66] There is an increasing literature on women in political parties in later years,[67]

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[64] Garner, *By His Own Merits*, p.261.

[65] Grimshaw, *Women's Suffrage in New Zealand*, p.97.

[66] Work on women's politics, such as accounts of the 'women's parliament', the National Council of Women, give little attention to electoral politics. Roberta Nicholls. *The Women's Parliament: The National Council of Women 1896-1920* (Wellington: Victoria University Press, 1996); Dorothy Page, *The National Council of Women: A Centennial History* (Auckland: Auckland University Press with Bridget Williams Books, 1996).

[67] This literature concentrates on women in the Labour Party. Liz Gordon, 'A Place in the Sun: Women in the New Zealand Labour Party' (1988), Unpublished manuscript; Barry Gustafson, *Labour's Path to Political Independence: The Origins and Establishment of the New Zealand Labour Party 1900-1919* (Auckland: Auckland University Press and Oxford University Press, 1980); Barry Gustafson, *The First Fifty Years: A History of the New Zealand National Party* (Auckland: Reed Methuen, 1986); Susan Jane Kedgley, 'Ladies in the Backroom: A Study of Women Party Activists in the National and Labour Parties' (Master of Arts, University of Otago, 1972); Melanie Nolan, 'Gender and the Politics of Keeping Left: Wellington Labour Women and Their Community, 1912-1949,' in *Communities of Women: Historical Perspectives*, ed. Barbara Brookes and Dorothy Page (Dunedin: University of Otago Press, 2002); Connie Purdue, ed., *Women in the Labour Cause: The History of the Women's Branch of the New Zealand Labour Party, 1925-1975* (Auckland: Auckland Women's Branch, New

but overseas studies have found that the strategies of political parties and women's groups in the early years after women's suffrage was won can have long term effects on women's ability to influence politics as women. Anna Harvey has argued that the major political parties in the United States mobilized women immediately after suffrage, seizing the advantage from women's groups and ultimately preventing those groups from using the threat of women's votes to influence policy.[68] Olssen's finding that women were largely marginalized in Caversham's political organizations of the 1890s suggests that the situation may have been different in Caversham at least, since Caversham political parties did not mobilize women in their interest. It is important to give space to the legacy of suffrage organizations in accounts of electoral politics immediately after the suffrage was granted. Marginalization may well have been as much the consequence of a political strategy of separateness as a result of exclusion from the political parties.

The marginalization hypothesis can be tested by considering men's and women's relative participation in election campaigns. If the hypothesis holds then women's participation in election campaigns and voting should have been lower than men's. This claim can be tested by assessing the rate of women's participation in the Christchurch election campaign. Women should be less likely than men to attend meetings, write letters to the paper, or participate in other aspects of the election campaign. It can also be assessed by comparing men's and women's voting rates over time. Under this hypothesis we would expect women's political activities to be less than and separate from men.

The opposing argument is that separation was more important than marginalization. If this is the case, then we would also expect women's political activities to be separate from men, but we would expect women's organizations to be active. Women's organizations may have worked to promote the politicisation of women. They may also have worked against it by emphasizing other interests, or merely fractured it, by politicizing some women: Liberal women, for example. The difference between 'separation' and 'marginalization' lies largely in interpretation. The key difference is whether the male political establishment provided a barrier to women's participation. This can be more easily tested by a local case study. The separation hypothesis can be tested by considering the role of women's political organizations in the Christchurch election campaign in 1893. It can also be tested on a broader scale by

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Zealand Labour Party, 1975); Sandra Wallace, 'Powder-Power Politicians: New Zealand Women Parliamentary Candidates' (PhD Thesis, University of Otago, 1992).

[68] Anna L. Harvey, *Votes without Leverage: Women in American Electoral Politics, 1920-1970* (New York and Cambridge: Cambridge University Press, 1998).

comparing trends in men's and women's participation and voting preferences with trends in the organization of women. Women's political participation should be higher when women form a coherent political identity, and changes in women's support for a particular party should correspond to whether women are mobilized in the interests of that party.

Political Debates, Preferences, and Voting

Difference between men and women in the political sphere prior to suffrage was also sustained by suffragists' claims that women had special policy interests, privileging social and moral issues. This claim coincides with political scientists' findings that women may vote along a different continuum to that of men. Suffragists' claims had three main strands, all of which made predictions about how women would cast their vote. The first was that women would only vote for candidates of integrity. Sheppard called on women to support the man who was 'truthful in speech, upright in his dealings, and cleanly in his life'.[69] Secondly, suffragists and their supporters emphasized the value of the home vote. Sir John Hall believed women would 'increase the influence of the settler and family man as against the loafing single man', and Sheppard also made this point.[70] Others clearly approved. William Bolt, a Dunedin radical and member of the Legislative Council, suggested that the family values espoused by suffragists were crucial in politics.

> If you want a man that is faithful to the his political pledges, that is anxious to do his best for his party, that takes an intelligent view of political questions, that does his duty as a citizen in the best way he can according to his intellect and opportunity, I say you will find a man that pays the closest attention to his family, is most careful about the comfort of his children and loves his wife.[71]

The third related claim was that women would support measures for the protection of women and children, particularly temperance. Women suffragists stressed that they did not ask for the suffrage on the grounds of temperance alone, and tended to frame this claim in terms of women's special concern for the interests of women and children rather than stressing

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[69] Sheppard, 'To Women Voters,' p.94.

[70] Quoted in Neill Atkinson, *Adventures in Democracy: A History of the Vote in New Zealand* (Dunedin: Otago University Press, 2003), p.91.See also [An Unknown Reporter], 'A Chat with the Franchise Superintendent,' pp.91-92; Garner, *By His Own Merits*, p.261.

[71] Bolt, Legislative Council, 23 August 1893, *NZPD*, Volume 81, p.275. Similar comments were made by British politicians. See Carolyn Spring, 'The Political Platform and the Language of Support for Women's Suffrage, 1890-1920,' in *The Men's Share? Masculinities, Male Support and Women's Suffrage in Britain, 1890-1920*, ed. Angela V. John and Claire Eustance (London and New York: Routledge, 1997).

temperance.[72] Other commentators believed that women would support temperance in large numbers, creating great concern amongst those who opposed prohibition. The brewers' lobby put pressure on the already reluctant Premier, Richard Seddon, to stop the passing of the bill that included women's suffrage because of fears that women would support temperance.[73] Ideals of masculinity were also invoked in the campaign for prohibition, but Jock Phillips has suggested that both prohibitionists and their opponents used the virtues of an ideal man to support their arguments for and against prohibition. Drinking was a central ritual of the male culture of the 'pioneer man'. Masculine pride was attached to the ability to consume large amounts of alcohol. Yet temperance and self-control were important attributes of the 'family man', an ideal that gained currency as the New Zealand population became more settled from the late nineteenth century. By World War I, Phillips argued, opponents to prohibition were invoking the ideal of the family man by suggesting that complete prohibition would remove the possibilities for men to develop strength of character and moral self-reliance through resisting the temptation of alcohol. Moderation was a masculine virtue.[74] While, both sides of the temperance debate used notions of masculinity, ideals of femininity were only associated with temperance. Anti-prohibitionists did not provide arguments against prohibition based on feminine virtues.

These claims about women's vote suggest three hypotheses. The first is the women were likely to support moral candidates. The second that is women would support measures in the interest of women and children. Both these hypotheses are difficult to test on a broad scale, but if they are true, then we would expect women voters in Christchurch to articulate their concern for the moral and the social issue, and for men to privilege other issues. The third hypothesis is that women were more likely to vote for prohibition. If this holds, we would expect women to express their support for prohibition during the 1893 election campaign, and we would also expect women's to vote for prohibition at the prohibition polls from 1894.

Claims about women's special voting preferences worked with their exclusion from mainstream electoral politics prior to the granting of women's suffrage to nurture the idea that women formed a constituency with particular interests. These claims also created the fears and uncertainties about women's party vote. These fears and uncertainties reflected the nature

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[72] Kate Sheppard, 'Address on the Subject of Woman Suffrage' (Printed as a leaflet following the 1889 Annual Convention of the New Zealand Women's Christian Temperance Union.) reprint, *The Woman Question*, ed. Margaret Lovell-Smith , pp.67-71.

[73] Coney, *Standing in the Sunshine*, p.31.

[74] Phillips, *A Man's Country?* , pp.55-65.

of a political system where politicians had the power to grant the vote to those who might or might not further those politicians' own political careers by voting for them.

In fact, the claims about how women would utilize their votes did not sit easily on conventional continuums of party voting, and it is difficult to make hypotheses about men's and women's party voting. Prohibition, for example, crossed political lines and 'moral candidates' could stand for any party. Moreover, notions of masculinity and femininity were invoked by politicians across the political spectrum, suggesting that party voting was not polarized by gender. Views about gender and gender difference underlay a number of political positions and the invocation of gendered ideals did not link women, or indeed men, with either conservative or Liberal positions, but allowed for the possibility that men and women might share political positions. The complications and overlaps frustrated efforts to predict men's and women's party votes and heightened anxieties of male politicians.

Hall hoped that women's home vote would strengthen the conservative opposition who represented the settled part of the community [75] and Sheppard suggested that women's concern for stability and caution might lead them to support more conservative candidates.[76] However, women's homemaking role and the importance of the settled part of the community underlay beliefs about the virtues of family land ownership and use that were held by Liberals as well as conservatives. Liberal reformist land legislation promoted the settlement of land by industrious and frugal family farmers, following the yeoman ideal. In many cases, the success of family farms relied on women's labour. [77] Furthermore, as Olssen has noted, women's homemaking role was also vital in workers' philosophies about work and skill, more usually associated with the Liberal party.[78] While ideals of femininity were crucial elements of these debates, so were ideals of masculinity. The pioneering man and the colonial helpmeet were seen to be vital parts of land settlement, and the male breadwinner relied on a wife at home. Complementary notions of masculinity and femininity were invoked in political debates.

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[75] Garner, *By His Own Merits*, p.261.

[76] Sheppard, 'To Women Voters,' p.93.

[77] Tom Brooking, *Lands for the People? The Highland Clearances and the Colonisation of New Zealand: A Biography of John Mckenzie* (Dunedin: University of Otago Press, 1996), Chapter 6; Denoon, Mein-Smith, and Wyndham, *A History of Australia, New Zealand and the Pacific*, p.204; Hamer, *The New Zealand Liberals*, pp.64-72.

[78] Olssen, *Building the New World.*

The association of suffrage with social reforms caused some commentators to predict women would support the Liberal party.[79] However, Sir G. S. Whitmore, member of the Legislative Council, believed other factors cut across gender difference. While country women might vote conservative, town women would tend to 'Radicalism'.[80] There was no consensus on the issue. Henry Fish claimed that women's votes would be conservative to an extent, providing a check on the 'socialistic "fads"' of the Liberals.[81]

Women's suffrage was more likely to be associated with the Liberals through Liberal concepts of egalitarianism and 'the people'. Some Liberals, like Seddon certainly opposed women's suffrage, but many Liberals supported it, as Dorothy Page has noted.[82] Those that did support it often expressed their support in terms of egalitarianism or democracy. Liberal notions of egalitarianism were linked to their emphasis on reform. Liberals claimed that conservative politics promoted the interests of a particular class, the landed and wealthy, over other groups. Reformist legislation advanced by the Liberals was designed to counter the dominance of one class over all others and to promote the interests of 'the people'. J. G. Findlay insisted that Liberalism meant

> the advancement of the general interests of the community and of all classes without distinction as against the privileges of an aristocratic ruling caste.[83]

Hence, when Alfred Saunders suggested that women's votes would promote the interests of all classes, he was linking women's suffrage with the Liberal cause. [84]

Liberals also invoked the idea of democracy, although most of the changes to men's eligibility to the vote had occurred before the Liberals came to power. Prior to 1890 men could register and vote in all electoral districts where they owned property. Plural voting was abolished before the 1890 election, and plural registration had also been abolished by 1893 when property owners could register and vote in just one electorate.[85] Carole Pateman has suggested that changing views about the contract between citizen and government, that is

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[79] Marion Hatton, 'Womanhood Franchise,' *The Globe*, 9 July 1892; reprint, *The Woman Question*, ed. Margaret Lovell-Smith, pp.73-79.

[80] Legislative Council, 18 August 1893, *NZPD*, Volume 81, 1893, p.144.

[81] House of Representatives, 9 August 1893, *NZPD*, Volume 80, 1893, p.544.

[82] Page, 'Introduction,' p.10.

[83] Quoted in Hamer, *The New Zealand Liberals*, p.40.

[84] Judith Devaliant, *Kate Sheppard: A Biography* (Auckland: Penguin Books, 1992), p.54; Garner, *By His Own Merits*, p.261; Hamer, *The New Zealand Liberals*, pp.40-46.

[85] Atkinson, *Adventures in Democracy*, pp.77, 94.

changing views of the vote, rather than of gender relations, helped win women the franchise.[86] Kate Sheppard noted the link:

> a striking parallel exists between the political history of the past fifty years and the history of the ideals of womanhood. When Victoria ascended the throne, our social atmosphere was distinctly aristocratic, but now it is unquestionably democratic.[87]

Ironically, the great opponent of women's suffrage, Henry Fish, based his arguments against women suffrage on the grounds of democracy. The last of suffrage petitions was presented to the House of Representatives by Sir John Hall, and was signed by over 30,000 women. Fish called the petitions 'gigantic frauds', believing that few of 'the people' wanted the suffrage, and consequently it should not be passed by a Liberal government.

> I say distinctly, for the last time, that the people of this colony, notwithstanding the petitions that this honourable member for Ellesmere [Hall] vaunts so much about, have not asked for this important change in their Constitution – and when I say 'people' I include both men and women.[88]

Marion Hatton, a Dunedin suffragist had responded indignantly to similar claims made by Fish in 1892, claiming that Fish was merely promoting his own personal interests, the very antithesis of the Liberal stance as representatives of the people.[89] Suffragists commended instead the 'manly' comments of another member of the House of Representatives, Otago politician, John McKenzie. McKenzie's support of women's suffrage stemmed from his ideas about the relationship between voters and the government, not from ideas about gender, confirming Pateman's point about the changing value of the vote. McKenzie admitted that he was not in favour of women's franchise.

> I think it is a very large, if not dangerous experiment, which may or may not prove of advantage to the Colony. But I can see well enough that the MAJORITY OF THE ELECTORS AND OF THE WOMEN wish it to be made the law of the land, and it is our business to comply with their wish.[90]

These kinds of claims cut across notions of gender difference to some degree, by emphasizing that men and women were both of 'the people'. Yet egalitarianism was not the same as

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[86] Carole Pateman, 'Three Questions About Womanhood Suffrage,' in *Suffrage and Beyond*, ed. Caroline Daley and Melanie Nolan.

[87] Sheppard, 'Ideals of Womanhood,' p.105.

[88] Henry Fish, House of Representatives, 11 August 1893, *NZPD*, Volume 80, p.592.

[89] Hatton, 'Womanhood Franchise,' pp.76-77.

[90] Quoted in Kate Sheppard, 'The Franchise,' *Prohibitionist*, 17 June 1893; reprint, *The Woman Question*, ed. Margaret Lovell-Smith , pp.85-86. See also Brooking, *Lands for the People?* p.184.

equality. Suffragists' invocations of democracy and egalitarianism were more likely to suggest that women were equal, but gender equality was not a primary feature of Liberal politicians' stance. Importantly, Liberal appeals to democracy and egalitarianism did not necessarily translate into legislation supporting suffragists' calls for women's emancipation. As Nolan has noted, the state balanced 'women's interests' with the interests of other groups.[91] Moreover, a number of feminist theorists have noted that notions of the supposedly gender neutral citizen inherent in many theories of democracy often work to exclude women.[92]

Although some political debates invoked notions of gender and gender difference, others appealed to similarities between men and women. This suggests that connections between politics and gender were untidy and that the tensions between different ideals were unresolved. Political debates were not polarized by gender, with men and women taking opposing sides, but they were criss-crossed by it. This suggests the hypothesis that, overall men and women did not have different party preferences. We would expect women and men to campaign for a variety of political parties, and to vote for a number of different political parties.

To summarise the testable hypotheses proposed above, there are four main hypotheses to be considered. The first is that women's participation in electoral politics was lower than men's. The second is that women's participation differed in kind, rather than degree: women were active in women's political organizations rather than inactive in politics. The third hypothesis is that men's preference for prohibition was lower then women's. The final claim is that men's and women's preferences for different parties were not substantially different with a wide variety of preferences amongst men and amongst women.

A close study of the 1893 election in Christchurch will further tease out the connections between political debates, organization and participation. It may sharpen the hypotheses that have arisen from the previous discussion. The disadvantage of a local study is that it cannot illuminate broader patterns over time and space. More fundamentally, the nature of the quantitative data means that men's and women's party votes are not known, making it difficult to both test hypotheses about men's and women's voting choices at the ballot box, and also to link the specifics of election campaigns with election outcomes at a local level.

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[91] Nolan, *Breadwinning*.

[92] Anne Phillips, *Engendering Democracy* (University Park, Pennsylvania: Pennsylvania University Press, 1991).

However, by considering election results in all electorates, it is possible to 'borrow strength' from other electorates to estimate differences in men's and women's voting at the local level and men's and women's overall voting preferences. Consideration of a larger data-set also strengthens the weight of the evidence. The combination of the national and the local, the quantitative and the qualitative allows the consideration of the hypotheses.

Sources and Quantitative Data

The hypotheses will be tested by a qualitative examination of the 1893 election and a quantitative analysis of election results from the 1893 and later elections. The examination of the 1893 election in Chapter Two relies largely on newspaper sources which are discussed more fully in that chapter. Historical quantitative studies rely on data collected in the past for particular purposes, and data-sets frequently require modification to be of use in such studies. Hence, the sources of the quantitative data used in Chapters Three to Five are discussed here in more detail.

The nature, development and regulations of the New Zealand electoral system govern what sources and data are available. From 1879 New Zealand general elections were held every three years unless the country was committed to war duties. Manhood suffrage was introduced the same year. From 1893, residents over the age of 21, both men and women, could register to vote in the electorate where they resided, with a few exceptions including lunatics and aliens. The number of these electorates grew over time, but in 1893 there were 62 such electorates. Registered voters were listed on the electoral rolls. On election day, those registered could cast a vote for the candidate of their choice. From 1896 until 1987 they could also vote for a number of different options for and against the prohibition of alcohol.[93]

Until 1902, urban electorates had a different electoral system. The populations of Auckland, Wellington, Christchurch and Dunedin electorates were around three times those of other electorates, and voters could cast up to three votes to select the three candidates who would represent the electorate. In 1908 and 1911, a different system was trialed in all electorates. If no candidate received a majority of the votes, then a second ballot was held one to two weeks later when only the top two polling candidates were listed. In this thesis, only counts from the first ballots of 1908 and 1911 have been considered.

Lack of data prohibits an analysis of gender differences amongst Māori voters. Māori voted under a different system, electing Māori members of parliament by voting in one of four

[93] Atkinson, *Adventures in Democracy*.

Māori electorates. They werenot, however, entitled to vote at liquor licensing polls until 1949. Māori men had the vote from 1867, and Māori women gained the vote along with Pākehā women in 1893. Before 1949, Māori did not vote using a secret ballot, but by declaration. There were no electoral rolls for Māori and officials could not record turnout of Māori voters, let alone differentiate between the voting rates of Māori men and women.[94]

The results of the elections were usually published the year after the general election in the *Appendices to the Journal of the House of Representatives* (*AJHR*) and the *New Zealand Official Yearbooks* (*NZOYB*).[95] The format of the results changed over time, but always included the number of votes each electorate candidate received, the number of men and women who registered in each electorate and the number of votes cast by men and women in each electorate. (In 1893 only women's registration and votes were listed, but men's can be worked out from the totals.) Votes for the various prohibition options were listed in a separate report. After 1954, men's and women's turnout were not separately listed. This limits the scope for analyses of gender and voting based on official election results to the period 1893 to 1954. Polling booth level election results were also available but were not useful since no details about men's and women's voting were recorded at that level.

It is not obvious why men's and women's voting rates should have been recorded. The evidence discussed in Chapter Three suggests that ideals about men's and women's roles shaped the way information was recorded in both census and election statistics. In many other countries, turnout was not separately listed for men and women.[96] Hence the New Zealand data provides a good opportunity to investigate rates of men's and women's electoral participation.

The official election results gave only candidate names, and not their party affiliations, making it impossible to analyse party votes without further information. Like most newspapers, the Christchurch daily, the *Press*, published lists of all candidates and their party affiliations. I have used the *Press* lists to identify candidates' party affiliations.

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[94] Atkinson, *Adventures in Democracy.*

[95] See Bibliography for details. Election results for elections after 1911 were also published in the *New Zealand Gazette*, but these returns were not considered in this thesis. See 'General Election, 1911', *New Zealand Gazette*, April 11 1912, pp.1287-1300. Prior to 1911, only the names of winning candidates were listed in the *New Zealand Gazette.*

[96] Tingsten reviews data from a number of different countries. Herbert Tingsten, *Political Behavior: Studies in Election Statistics* (Totowa, New Jersey: Bedminster Press, 1963).

The requirements for establishing electorate boundaries led to the production of limited data about electorate populations, including the number of inhabitants who lived in rural and urban areas. Electorate boundaries were not constant, but from 1887 were determined approximately every five years by the Representation Commission who attempted to divide the country into electorates with relatively even population counts. These divisions also took into account factors such as communities of interest, topographical features and ease of communication within each electorate. From 1881 until 1945, population counts were adjusted in accordance with the 'country quota', which gave extra weight to the population in rural areas. The 'rural' population consisted of those living in communities smaller than 2000 people and more than five miles from a central post office located in one of the four urban centres. The remaining population was classified 'urban'. Generally, because of the country quota, more rural electorates had a smaller number of electors than urban electorates.[97] The rural-urban data formed the basis of Chapman's and other historians' analyses of the election data.

There is little other information available at the electorate level. Five-yearly censuses provided little information about electorates as such, giving only population counts. (Census data did include the number of Chinese in an electorate.) Most census data described census division, geographical areas with boundaries that differed from electorate boundaries. Robert Chapman did use census data to assess the relative wealth of electorates. He matched election data with census data by disaggregating and reaggregating electorate data. Results from polling booths were combined to form new 'electorates' that matched census divisions.[98] Unfortunately this method is of little use here since polling booth level data did not separate men's and women's votes. Re-aggregation of the polling booth data would give more information about factors like wealth or employment that can be linked to overall voting patterns in an area, but it would not have aided an analysis of the relationship between gender and voting.

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[97] Atkinson, *Adventures in Democracy*, especially pp.72-76; Lipson, *The Politics of Equality: New Zealand's Adventures in Democracy*, pp.174-184. See also the Reports of the Representation Commission, listed in the Bibliography.

[98] Chapman, 'The General Result,' pp.255-257.

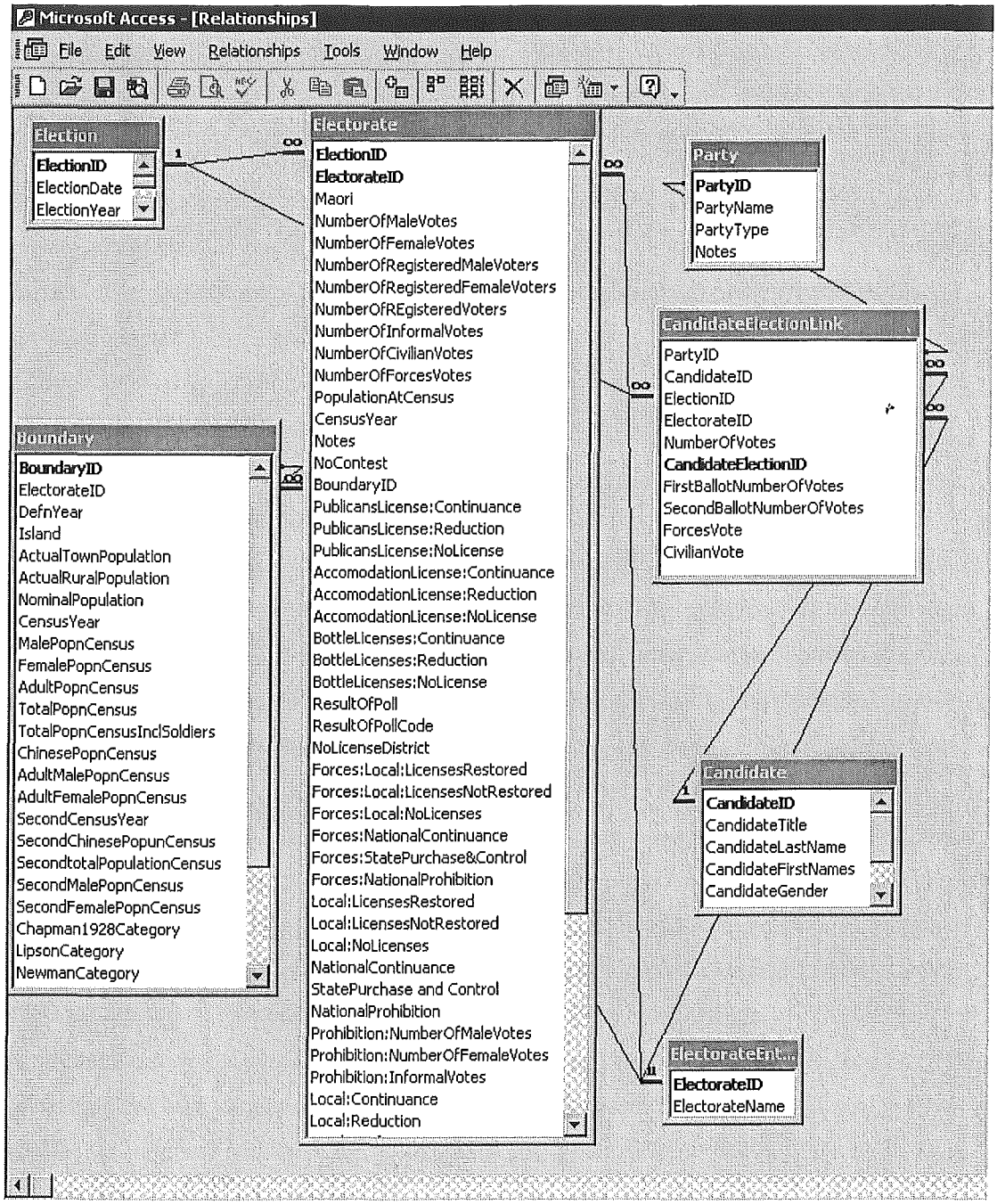

Figure 1.1 Relationships Between Tables in Election Data Database

Even once voting, candidate, party and population data were collected, compilation of the data is not straightforward. Candidate names listed in the official results do not necessarily correspond exactly with those listed in the *Press*, and linking the two sources was a tedious process. Data on turnout and candidate voting in the official election results is listed in a number of different tables that also needed to be linked. Moreover, the data have a hierarchical structure, with many elections, many electorates, and many fields of electorate

data. I established a relational database using *Microsoft Access* to allow me to link these sources and ask relevant questions of the data.[99]

The database was constructed using a number of tables, largely corresponding to tables in the primary sources, which have been linked using 'ID' variables. The relationships between the tables are shown in Figure 1.1. The 'Electorate' table has the most fields, since it includes the myriad of options for prohibition voting over the period. Candidate and party information is included in three different tables which were then linked together. The database also includes a 'Boundary' table. This table includes information from reports of the Representation Commission and data taken from census reports.

The database has been designed to maximize the possibilities of the available data, and contains a great deal of information not utilized in this thesis. For example, the database holds data on party and prohibition voting after 1919 not examined here. Armed forces votes at the World War II election of 1943 are detailed in the Electorate table for that election. The data could also be used to answer questions not considered here. Possible investigations include studies of three-way contests and of candidate incumbency between 1893 and 1954. Extra data can easily be added to the database if necessary.

Using the report function in the database, it is possible to generate tables giving different sorts of information. For example, Figure 1.2 shows a simple table listing candidate names, party affiliation and the proportion of votes they received (candvot) for a number of electorates in 1893. Also listed in the table are the rural population proportions (rurpop),[100] the proportion of eligible women that voted in 1893 (womtnot), and the proportion of eligible men that voted (mentnot).[101] These variables will be utilized later in the thesis. Compilation of such a table without the database would have required referring to four different tables in three different publications.

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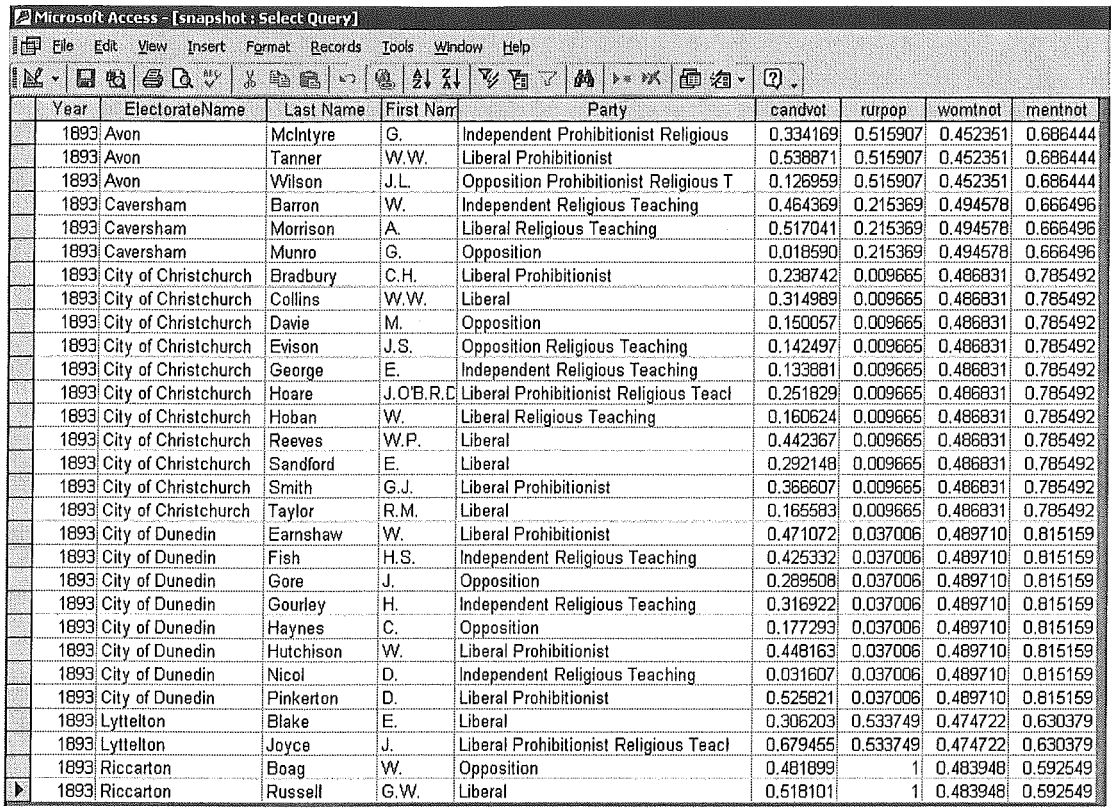
[99] Catapult Inc., *Microsoft Access 97 Step by Step* (Redmond, Washington: Microsoft Press, 1997).

[100] Rurpop is defined by $\frac{Ruralpopulation}{Rural + Urbanpopulation}$.

[101] Women's Turnout is defined by $\frac{Numberwomenwhocastavote}{NumberAdultWomen}$, where number adult women is taken from the 1896 census. Men's turnout is similarly defined.



Microsoft Access - [snapshot : Select Query]

File Edit View Insert Format Records Tools Window Help

Year	ElectorateName	Last Name	First Nam	Party	candvot	rurpop	womtnot	mentnot
1893	Avon	McIntyre	G.	Independent Prohibitionist Religious	0.334169	0.515907	0.452351	0.686444
1893	Avon	Tanner	W.W.	Liberal Prohibitionist	0.538871	0.515907	0.452351	0.686444
1893	Avon	Wilson	J.L.	Opposition Prohibitionist Religious T	0.126959	0.515907	0.452351	0.686444
1893	Caversham	Barron	W.	Independent Religious Teaching	0.464369	0.215369	0.494578	0.666496
1893	Caversham	Morrison	A.	Liberal Religious Teaching	0.517041	0.215369	0.494578	0.666496
1893	Caversham	Munro	G.	Opposition	0.018590	0.215369	0.494578	0.666496
1893	City of Christchurch	Bradbury	C.H.	Liberal Prohibitionist	0.238742	0.009665	0.486831	0.785492
1893	City of Christchurch	Collins	W.W.	Liberal	0.314989	0.009665	0.486831	0.785492
1893	City of Christchurch	Davie	M.	Opposition	0.150057	0.009665	0.486831	0.785492
1893	City of Christchurch	Evison	J.S.	Opposition Religious Teaching	0.142497	0.009665	0.486831	0.785492
1893	City of Christchurch	George	E.	Independent Religious Teaching	0.133881	0.009665	0.486831	0.785492
1893	City of Christchurch	Hoare	J.O'B.R.D	Liberal Prohibitionist Religious Teacl	0.251829	0.009665	0.486831	0.785492
1893	City of Christchurch	Hoban	W.	Liberal Religious Teaching	0.160624	0.009665	0.486831	0.785492
1893	City of Christchurch	Reeves	W.P.	Liberal	0.442367	0.009665	0.486831	0.785492
1893	City of Christchurch	Sandford	E.	Liberal	0.292148	0.009665	0.486831	0.785492
1893	City of Christchurch	Smith	G.J.	Liberal Prohibitionist	0.366607	0.009665	0.486831	0.785492
1893	City of Christchurch	Taylor	R.M.	Liberal	0.165583	0.009665	0.486831	0.785492
1893	City of Dunedin	Earnshaw	W.	Liberal Prohibitionist	0.471072	0.037006	0.489710	0.815159
1893	City of Dunedin	Fish	H.S.	Independent Religious Teaching	0.425332	0.037006	0.489710	0.815159
1893	City of Dunedin	Gore	J.	Opposition	0.289508	0.037006	0.489710	0.815159
1893	City of Dunedin	Gourley	H.	Independent Religious Teaching	0.316922	0.037006	0.489710	0.815159
1893	City of Dunedin	Haynes	C.	Opposition	0.177293	0.037006	0.489710	0.815159
1893	City of Dunedin	Hutchison	W.	Liberal Prohibitionist	0.448163	0.037006	0.489710	0.815159
1893	City of Dunedin	Nicol	D.	Independent Religious Teaching	0.031607	0.037006	0.489710	0.815159
1893	City of Dunedin	Pinkerton	D.	Liberal Prohibitionist	0.525821	0.037006	0.489710	0.815159
1893	Lyttelton	Blake	E.	Liberal	0.306203	0.533749	0.474722	0.630379
1893	Lyttelton	Joyce	J.	Liberal Prohibitionist Religious Teacl	0.679455	0.533749	0.474722	0.630379
1893	Riccarton	Boag	W.	Opposition	0.481899	1	0.483948	0.592549
1893	Riccarton	Russell	G.W.	Liberal	0.518101	1	0.483948	0.592549

Figure 1.2 Votes for Candidates in 1893

The table also illustrates the scope of the data. Men's and women's voting rates or turnout are known for each electorate. Hence differences between men's and women's participation can be determined. However, men's and women's party votes are not known. An important property of the available data is also revealed in Figure 1.2. As already noted, the data-points describe electorates, not individuals. Prior to the introduction of opinion surveys in the 1940s,[102] no data was collected to describe individual voting choices. The smallest unit for which information was recorded was the polling booth, but no information about gender was collected at this level.

The problem, then, then is how use the available data to infer women's and men's preferences for parties and prohibition. Unfortunately, inference is hindered by the problem of the ecological fallacy.

[102] Clive Bean, 'An Inventory of New Zealand Voting Surveys, 1949-84,' *Political Science* 38, no. 2 (1986).

The Ecological Fallacy

The ecological fallacy is a serious statistical problem that hinders analysis of grouped data. Ogburn and Goltra, perhaps the earliest analysts of men's and women's voting patterns, realised the problem when they attempted to establish voting preferences of men and women in Oregon.

> The difficulty... lies in the fact that women's ballots are not distinguished from those of men but are deposited in the same ballot box... [O]ne wonders if there is not some indirect method of solving the problem. The height of a waterfall is not measured by dropping a line from the top to the bottom, nor is the distance from the earth to the sum measured by a rod and chain.[103]

Ogburn and Goltra used correlations to 'unscramble' men's and women's votes, unaware that correlations can produce fallacious results when applied to group data. The ecological fallacy refers to the error of assuming that relationships evident in group data correspond to relationships at the individual or sub-group level. Often the patterns evident at a group level are quite different to those an the underlying individual level. Using standard statistical measures of association, such as correlation or regression, to infer individual behaviour from grouped data can produce fallacious conclusions.

The fallacy was first comprehensively explored by W. S. Robinson in 1950. Robinson identified the fact that statistical measures based on group data did not necessarily reflect patterns in the underlying, but often unknown, individual data. Robinson used data on illiteracy and foreign birth from the 1930 United States census to illustrate the problem. Individual level data was available. The individual Pearson correlation between illiteracy and foreign birth was 0.118, a weak positive association that suggested the foreign born were slightly more likely to be illiterate. Robinson then turned to data arranged by census division. This data described illiteracy and foreign birth in each census division. Here each data-point described a group of individuals, rather than just one individual. When Robinson performed a 'ecological' correlation analysis on data from census divisions, the Pearson correlation was –0.619, suggesting a much stronger association in the opposite direction. In other words, a correlation based on group data suggested that the foreign born were less likely to be illiterate, the opposite to the true trend revealed by the individual correlation. Furthermore, when Robinson performed a third correlation based on data that described states, rather than census divisions, the correlation was –0.526. This result also suggested the opposite to the individual trend. Robinson concluded that 'the only reasonable assumption is that an

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[103] William F. Ogburn and Inez Goltra, 'How Women Vote: A Study of an Election in Portland, Oregon,' *Political Science Quarterly* 34 (1919): p.413-414.

ecological correlation is almost certainly not equal to its corresponding individual correlation'.[104]

The key to understanding the problem lies in the process of aggregating individual data into groups. 'Aggregate data' describes aggregations of individuals. In the data used in this thesis, the aggregations are electorates. Aggregate data differ from, for example, survey data, where the data-points describe individuals rather than groups. In the process of aggregation, information about individuals is lost. How much loss is incurred depends on a variety of factors including group size and the composition of the group.[105] The problem can be compared with the problem of missing data in historical sources. A recent investigation of Chinese population registers showed that missing data could have caused severe bias in these registers.[106] Similarly, loss of information in aggregate data can bias statistical measures based on that data.

Robinson's article deterred many researchers from using group-based data to infer individual behaviour. Political scientists embraced survey data. Indeed, Robinson's article was published at the very point at which survey data became fashionable, following the use of opinion surveys during American presidential campaigns from 1940 and the work of David Butler and Nuffield College on British elections post World War II. The first New Zealand voting survey was carried out in 1949. [107] However, lack of data describing individual voting prior to World War II, meant that the ecological fallacy continued to hinder analyses of earlier elections. There are some analyses of New Zealand data where the ecological fallacy should have been considered, when it has not been. For example, A. R. Grigg used correlations to investigate women's prohibition voting.[108] As Robinson showed, correlations from aggregate data do not reveal any information about individual behaviour and no claims can be made about women's support of prohibition based on correlations from electorate data.

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[104] W. S. Robinson, 'Ecological Correlations and the Behaviour of Individuals,' *American Sociological Review* 15, no. 3 (1950).

[105] Attempts to quantify the error in ecological correlations have not been entirely successful. One study found that aggregation often, but not always amplifies correlations. D. G. Steel and D. Holt, 'Rules for Random Aggregation,' *Environment and Planning A* 28 (1996): 977.

[106] Tim Futing Liao, 'Estimating Household Structure in Ancient China by Using Historical Data: A Latent Class Analysis of Partially Missing Patterns,' *Journal of the Royal Statistical Society Series A (Statistics in Society)* 167, no. 1 (2004).

[107] Bean, 'An Inventory of New Zealand Voting Surveys, 1949-84.'

[108] Grigg, 'Prohibition and Women.'

There is still debate over whether individual or aggregate data best describe election behaviour. As Stephen Voss has suggested, use of survey data encourages individual models of voting behaviour. Survey data encapsulates the preferences and identifications of individuals. By contrast, group data encapsulates the social context. The use of the term 'ecological' suggests the concept of community, evoking an ecological system, where the activities of members are dependent on those of other members. Voting preferences are a combination of individual and group factors, and the interaction between the two. The best models for voting preferences would include both group and individual factors. This suggests there is a place for aggregate data.[109]

Analysts of aggregate data who are only interested in group behaviour, can use aggregate data without facing the ecological fallacy. For example, if a researcher wished to measure the effect of changes in election law on voting rates, group data would be appropriate. Chapman's analysis of New Zealand elections was based on electorate preferences, and so he largely avoided the ecological fallacy. It is, however, very easy to confuse group voting with individual voting. For example, Chapman claimed that small town proprietors and professionals voted differently from small town industrial workers. Strictly speaking, the data he considered did not show this, but merely that small towns as a whole had mixed voting preferences.[110]

For many questions, aggregate data are not suitable, even when researchers are interested in group behaviour. The problem with election data based on geographical groups is that the groups described by the data are not necessarily politically meaningful.[111] In many cases, election data needs to be disaggregated to reveal information about groups of interest, such as men and women, or proprietors and industrial workers. This forces analysts to consider methods of ecological inference. Ecological inference is the process of using aggregate data to infer individual level relationship. To date, methods for ecological inference concentrate on

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[109] J. Morgan Kousser, 'Ecological Inference from Goodman to King,' *Historical Methods* 34, no. 3 (2001): pp.108-109; D. Stephen Voss, *Ecological Inference and Contextual Research: In Pursuit of the Southern Cross-Tab* (Prepared for the New Advances in Ecological Inference Conference, Centre for Basic Research in the Social Sciences, Cambridge, Ma, June 2002) (2002, accessed 25 June 2002); available from www.cbrss.harvard.edu/events/eic/papers/voss.pdf. See also Wright, James E. 'The Ethnocultural Model of Voting: A Behavioural and Historical Critique,' in *Emerging Theoretical Models in Social and Political History*, ed. Allan G. Bogue (Beverly Hills and London: Sage Publications, 1973).

[110] Chapman, 'The General Result,' p.242.

[111] Kousser, 'Ecological Inference from Goodman to King,' p.109.

estimating the unknowns, rather than estimating measures of association. Use of technigues for ecological inference allows the estimation of the men's and women's party and prohibition votes, and hence the testing of hypotheses regarding men's and women's voting choices.

Over the last decade, interest in aggregate data and ecological inference has revived. In the United States, there is particular interest in the voting patterns of racial groups since federal law prohibits voting discrimination based on race, colour or language. Turnout is of particular concern, but researchers also wish to determine whether the votes of majority groups prevent minorities from electing the candidate of their choice. Such discrimination is deemed to have occurred if researchers can prove that members of a particular racial group voted consistently and differently from other voters. If discrimination is found, districts can be forced to redraw political boundaries or change aspects of electoral law. Lack of survey data, and their known unreliability in racially polarised elections, forces analysts to use aggregate data to decide if racially polarised voting occurred.[112]

Aggregate data has also been found to be of use in epidemiological studies. For example, occupational exposure to benzene is associated with increased risk of leukaemias, but the role of environmental benzene exposure, mainly arising from cigarette smoking and vehicle exhausts, is unknown. Collecting data about individual exposure to environmental benzene would be difficult and expensive, so researchers have utilised aggregate data that details benzene levels and the levels of childhood leukaemias in Greater London to investigate the relationship.[113]

Interest has also been sparked by the proposal of new methods to infer individual behaviour from aggregate data. In particular, Gary King's book, *A Solution to the Ecological Inference Problem*, published in 1997, stimulated both use of his technique and the proposal of new solutions.[114] The range of methods available is now wide, but to date historians have considered only a few methods for ecological inference. In particular, historians have focused

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[112] Gary King, *A Solution to the Ecological Inference Problem: Reconstructing Individual Behavior from Aggregate Data* (Princeton, New Jersey: Princeton University Press, 1997), pp.8-9.

[113] Nicky Best and others, 'Ecological Regression Analysis of Environmental Exposure and Childhood Leukemia: Sensitivity to Data Inaccuracies, Geographical Scale and Ecological Bias,' *Journal of the Royal Statistical Society Series A (Statistics in Society)* 164 (2001). See articles in the same issue of the journal for other epidemiological studies.

[114] King, *A Solution to the Ecological Inference Problem.*

their attention on King's parametric method for ecological inference and Goodman's ecological regression.[115] Both these methods are relatively easy to implement. Goodman's method is based on simple regression and software to implement King's parametric method is freely available.[116] However, as discussed later in this thesis, neither of these methods perform particularly well when applied to data classified by gender. In Chapter Four three methods not previously used by historians are considered and trialed, and found to perform well on data classified by gender. These methods are King's non-parametric method, the semi-parametric method and the homogenous method. The non-parametric method is then used to estimate men's and women's party and prohibition votes. The results of this estimation is detailed in Chapter Five.

Methods for ecological inference are particularly appropriate for use in voting studies for two reasons. The first is that because they are based on group data, they take into account group factors, such as the nature of an election campaign, or the economic and social characteristics of electorates. Factors based on geographical areas are seldom included in survey data which can remove individuals from their context. Moreover, recent methods for ecological inference balance local differences with national patterns, by using local variation (as well as some assumptions) to estimate the unknowns. Most methods provide both local, or electorate-specific estimates, and overall estimates. Hence, the estimates give local detail, as well as evidence of national patterns. These characteristics help to mitigate against the tendency for quantitative methods to ignore the differences in the categories they analyse, categories such as 'men' and 'women'. While methods for ecological inference cannot differentiate between

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[115] Early consideration of methods for ecological inference by historians included E. Terence Jones, 'Using Ecological Regression,' *Journal of Interdisciplinary History* 4, no. 4 (1974); J. Morgan Kousser, 'Ecological Regression and the Analysis of Past Politics,' *Journal of Interdisciplinary History* 4, no. 2 (1973); Allan J. Lichtman, 'Correlation, Regression and the Ecological Fallacy: A Critique,' *Journal of Interdisciplinary History* 4, no. 3 (1974). A full issue of *Historical Methods* was also dedicated to the ecological fallacy. Paul Bourke, Donald DeBats, and Thomas Phelan, 'Comparing Individual-Level Returns with Aggregates,' *Historical Methods* 34, no. 3 (2001); Kousser, 'Ecological Inference from Goodman to King.'; J. Morgan Kousser, 'Evaluating Ecological Inference: An Introduction,' *Historical Methods* 34, no. 3 (2001); Jeffrey B. Lewis, 'Understanding King's Ecological Inference Model: A Method-of-Moments Approach,' *Historical Methods* 34, no. 4 (2001); Bradley Palmquist, 'Unlocking the Aggregate Data Past - Which Key Fits?,' *Historical Methods* 34, no. 4 (2001); Kent Redding and David R. James, 'Estimating Levels and Modeling Determinants of Black and White Voter Turnout in the South, 1880-1912,' *Historical Methods* 34, no. 4 (2001).

[116] The software can be downloaded from Gary King's homepage http://gking.harvard.edu/stats.shtml.

women (or men) in a single electorate, they do take into account differences between electorates.

The inclusion of a case-study in this thesis is intended to highlight the fact that differences amongst men and women were evident in electorates. However, analysis of the broader pattern of men's and women's electoral participation and voting shows that there were similarities across time and space. As Catherine Hall has suggested, "It would be a pity if... the ever more complex understanding of the ways in which gender difference interacts with other axes of power, were to prevent us in the future from moving from the particular to the general'.[117]

[117] Hall, *White, Male and Middle Class*, p.7.

Chapter 2
The Christchurch Election Campaign of 1893

This chapter looks closely at the progress of the 1893 election in Christchurch. It has two main aims. The first is to assess the importance of gender and gender difference in the events, language and organization of the election campaign. To what extent did gender matter in political organizations and events? Were constituencies of men and women created during the election campaign? This chapter also examines the participation and role of new women voters, reflecting and examining the emphasis on women in contemporary accounts of the campaign. Were women marginalized, as the historiography has suggested? What was the role of women's and suffragists' organizations? The chapter is divided into five sections. The first reviews existing accounts of the election, and describes the nature of the Christchurch electorate. The second section discusses the sources for this chapter. The third discusses registration. The fourth analyses the events of the campaign, and the final section looks at the issues of the campaign and Christchurch voters' opinions. The evidence suggests that gender was important in the campaign, both in political language and organization. Some women at least were enthusiastically involved in the election campaign, despite facing resistance from the political establishment.

The City of Christchurch Electorate

Existing accounts of the 1893 election in the City of Christchurch electorate and the surrounding electorates of Avon, Riccarton and Lyttelton, focus on personalities, issues and party political organizations. The roles of the City of Christchurch candidate and Liberal Minister of Labour, William Pember Reeves, and his wife Maud, have been covered in two biographies by Keith Sinclair and Ruth Fry. Sinclair tracked Reeves' role, but admitted Maud's part in the election campaign, which was emphasised in Fry's account. W. H. Scotter and P. H. Downey, writing in the 1960s, reviewed the general election throughout Canterbury, emphasising the campaigning of candidates and political organisations and their appeal to voters. Although Downey did discuss the effects of women's suffrage, the way new women voters entered and shaped the shifting alliances of local electoral politics has not been explored in existing accounts.[1]

[1] P.H. Downey, 'The 1893 General Election in Canterbury' (MA Thesis, University of Canterbury, 1966); Ruth Fry, *Maud and Amber: A New Zealand Mother and Daughter and the Women's Cause 1865 to 1981* (Christchurch: Canterbury University Press, 1992); W.H. Scotter, *A History of*

There are some disadvantages in choosing Christchurch for a case study. It was a settled, urban area, and thus there is little opportunity to investigate the importance of the less settled populations or to compare the behaviour of urban voters by gender with that of rural voters. The strength of the Liberal party and the weakness of the conservative opposition hinders analysis of partisan politics in the city, although this problem is somewhat overcome by the competitive partisanship of the two major daily newspapers which is discussed later in the chapter. Of course, the weakness of the conservatives was nation-wide. The conservatives lacked any kind of party structure, and consisted, almost by default, of (1) those who preferred the leadership of William Rolleston to Richard Seddon, (2) those who professed more conservative views than those of Liberal candidates, or (3) those who opposed party government altogether. In fact any studies of partisanship at this time are difficult because of the lack of well-developed national party structures. Even the party structure of the Liberals was based in parliament rather than in electorates. A number of electorates, including Christchurch, had several Liberal candidates as a result. Each New Zealand electorate had a particular character, and this chapter should be seen as a case study, rather than a definitive picture of electoral politics. A close reading of the intricacies of local power structures is more likely to reveal interactions between ideals and actual participation in electoral politics than a broad sweep of many electorates.

Most Christchurch residents lived within the boundaries of the City of Christchurch electorate. This was one of four urban electorates, whose electorate boundaries encompassed a population approximately three times that of other electorates. The others were the City of Auckland, the City of Wellington and the City of Dunedin electorates. Voters in urban electorates could vote for up to three candidates, and the three that topped the poll became members of the House of Representatives for the electorate.

Canterbury Volume III, 1876-1950 (Christchurch: Canterbury Centennial Historical and Literary Committee and Whitcombe and Tombs Ltd, 1965); Keith Sinclair, *William Pember Reeves: New Zealand Fabian* (Oxford: Clarendon Press, 1965).

Table 2.1 City of Christchurch Candidates

Candidate	Affiliation	Prohibition Views	Religious Education Views	Other
Rev. C. H. Bradbury	Progressive Liberal Association	Prohibitionist	Supported Bible in Schools	
W. W. Collins	Canterbury Liberal Association	Supported by Licensed Victuallers although an abstainer	Supported Existing Secular System	Freethinker; Supported by *Lyttelton Times*
M. Davie	Opposition	Moderate Prohibition Views	Opposed Denominational Education	Supported by *Press*
J. Evison	Opposition	Moderate Prohibition Views	Supported Catholic claims for grants to Catholic schools and Catholic Electoral Representation Committee	Editor of *Truth*, Supported by *Press*
Eden George	Independent Liberal	Moderate Prohibition Views	Supported Catholic claims for grants to Catholic schools schools and Catholic Electoral Representation Committee	Mayor of Christchurch; Supported by *Press*
Rev. J. O'B. Hoare	Progressive Liberal Association	Prohibitionist	Supported Bible in Schools	
W. Hoban	Independent Liberal	Supported by the Licensed Victuallers' Association	Supported Catholic claims for grants to Catholic schools schools and Catholic Electoral Representation Committee	
W. P. Reeves	Canterbury Liberal Association (Labour sympathies)	Supported by the Licensed Victuallers' Association	Supported Existing Secular System (Was Minister of Education)	Incumbent MHR; Supported by *Lyttelton Times*
E. Sandford	Canterbury Liberal Association (Labour sympathies)	Some controversy over whether he was supported by the Licensed Victuallers. Did refuse a prohibition nomination	Supported Existing Secular System	Incumbent MHR; Supported by *Lyttelton Times*
G. J. Smith	Progressive Liberal Association	Active Prohibitionist	Supported Existing Secular System	
R. M. Taylor	Independent Liberal (Labour sympathies)	Had previously pledged to support Liquor interests, but had supported a prohibition bill in the previous parliament	Opposed Denominational Education	Incumbent MHR

Male voters in previous Christchurch elections had established a political system based on local organisations which supported candidates or issues and were formed to campaign at a particular election. The election of 1893 was no different. Election candidates were backed by voters' organisations. The affiliations of candidates in the City of Christchurch electorate are shown in Table 2.1.

The most established organisation was the Canterbury Liberal Association. It supported three Liberal candidates in Christchurch: William Pember Reeves, the free-thinker W.W. Collins and the incumbent Ebenezer Sandford. Candidates for other Canterbury electorates were also nominated by the Association. A recent splinter group, the Progressive Liberal Association, supported both more radical Liberal principles and prohibition, and its members chose a different set of candidates willing to support prohibition, amongst them G. J. Smith who was one of the three successful candidates in 1893. The city was home to several prohibition campaigners who fanned the issue by holding regular prohibition meetings in the city, and insisting the candidates reveal their position on prohibition. Other active groups included the publicans' alliance, the Licensed Victuallers' Association, which was anxious to increase the anti-prohibition vote, and the Catholic Electoral Representation Committee who nominated three candidates willing to support state aid for Catholic schools. Opposition candidates, such as Mortimer Davie, relied on electoral committees but there was no party organisation as such, although there had been at previous elections. Liberals dominated the political scene. [2]

A number of other political groups were active in Christchurch over the period. Working men's political groups had participated at previous elections, and the radical Knights of Labour continued to meet in 1893, but their activities did not feature much in the mainstream press. The Women's Christian Temperance Union and the Canterbury Women's Institute were active in the campaign for women's suffrage, but there is little evidence that these organisations participated in the election campaign, though individual members certainly did. Unfortunately, as in Olssen found for Caversham, there is little record of suffragists' political activities at the 1893 election. There are no extant records from either the WCTU of the Canterbury Women's Institute that cover the election period.

The surrounding electorates of Avon, Lyttelton and Riccarton were smaller and were represented in the House of Representatives by only one candidate. These electorates were more rural that the city electorate, but all looked towards Christchurch. William Tanner, a labour advocate, easily won the Avon seat against two other candidates. The Lyttelton seat was won by John Joyce, a Liberal prohibitionist, against the incumbent member for Avon, E. Blake, who had shifted constituencies. The Riccarton electorate combined surburban areas

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[2] Downey, 'The 1893 General Election'; Jim McAloon, 'Radical Christchurch,' in *Southern Capital: Towards a City Biography*, ed. John Cookson and Graeme Dunstall (Christchurch: Canterbury University Press, 2000); Scotter, *A History of Canterbury*, pp.192-198.

with established farming districts. Liberal G. W. Russell competed with William Boag, a conservative for the seat.

Sources

The absence of extant records from the various political organisations active at the time forces a reliance on newspapers. The main sources for this chapter were the two Christchurch daily newspapers the *Press* and the *Lyttelton Times*. There were other Christchurch papers, but these were produced by the same publishers. The *Christchurch Star* and the weekly *Canterbury Times* were produced by the *Lyttelton Times* and offered similar views. The editors of *Press* also produced a weekly, the *Weekly Press*. Candidate J. S. Evison edited a newspaper called the *Truth*, but unfortunately, few issues are extant.[3] The temperance weekly, the *Prohibitionist,* was produced in Christchurch, but concentrated on the national campaign for prohibition. However, the Women's Christian Temperance page, edited by Kate Sheppard, provided interesting commentary on the local campaign. These columns indicate that Sheppard, who was registered to vote in the Riccarton electorate, kept a beady eye on the local newspapers.[4]

Use of newspapers as a source for political events is complicated by the fact that the newspapers themselves were important players in local politics in the 1890s, being decidedly partisan. The *Press* tended to support conservative candidates, while the *Lyttelton Times*, in which the family of local Liberal politician William Pember Reeves held a share, supported the Liberal Party. This partisanship was revealed in the editorial comment on government policy and the trifecta of candidates they supported. Newspapers named the candidates they preferred and took issue with the selections, statements and opinions of the other side. [5] Partisanship could alter the tone and content of newspaper accounts. The *Press* consistently mocked Reeves, despite his popularity, and 'A Woman Elector' accused the *Press* of 'slanderous and malignant misrepresentations' of one of Reeves' political meetings.[6] The

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[3] Those that do remain are held at the Canterbury Museum but no extant issues relate to the pre-election period.

[4] See for example Kate Sheppard, 'Our First Election,' *Prohibitionist*, 9 December 1893; reprint, *The Woman Question: Writings by the Women Who Won the Vote*, ed. Margaret Lovell-Smith (Auckland: New Women's Press, 1992), pp.99-100. A number of articles from the W.C.T.U. page of the *Prohibitionist* have been published in *The Woman Question*. A complete set of the *Prohibitionist* is held at Dunedin Public Library.

[5] See for example *Lyttelton Times*, 25 November 1893, p.4 and 27 November 1893, p.4.

[6] *Lyttelton Times*, 3 November 1893, p.2.

Times' editor revealed on one occasion that correspondents of 'the wrong colour' could not assume their letters would be published in full. Faced with a mass of correspondence in the days just prior to the election, the *Times* did not publish all letters.[7] Newspapers' partisanship can be seen as election campaigning on the part of the editors, and politicians exploited it. The Liberal leader, Richard Seddon, praised the *Times'* Liberal stand for example.[8] Clearly the papers' reports should not be taken at face value, and the newspapers should be viewed as a site of political debate. The content of the newspapers did not simply reflect wider debate, but helped shape that debate which was competitive and partial.

Nevertheless, the papers did provide a forum for debate. Correspondents used newspapers to offer their opinions and take issue with the papers' stance. Paid advertisements also dealt with political subjects. Although the papers' partisanship may have prevented the publication of some correspondents' views, the papers reveal something of the spectrum of local opinion.

The newspapers also reported on the events of the election campaign. Meetings received the best press. Some committee meetings were reported upon, and candidates' public meetings were usually described in full, although the partisan views of a paper could dictate the degree of detail given. While the papers noted attendance numbers at meetings, they only seldom noted the names of those supporting candidates, or of those speaking or asking questions at these meetings. Advice to voters given from the pulpit by priests and bishops was also noted in the local papers. The newspapers make it clear that canvassers did go door to door at least in some parts of Christchurch, but the incidence, focus and success of canvassing is not evident.

Of course, private debates did not appear in the newspapers' columns. Reliance on newspaper reports renders invisible debates over the dinner table and the back fence which were not reported on. Reticent electors who did not write to the papers or speak at meetings may not have had their opinions represented. The *Press* did publish the reluctant public statement of an Otago resident, Lady Seafield, who had not registered as an elector and had 'no intention' of doing so.[9] Importantly, the opinions of those, including women, who refrained from attending meetings or contributing to published media are simply not available directly, and it is necessary to rely on others' reports of their opinions and behaviour.

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[7] *Lyttelton Times*, 23 November 1893, p.6, 27 November, p.3.

[8] *Lyttelton Times*, 27 November 1893, p.5.

[9] *Press*, 8 November 1893, p.4.

Women's opinions were largely absent from newspaper pages. The media was dominated by men in the late nineteenth century. Few women journalists were writing outside suffrage circles. The weekly *Canterbury Times* did have a ladies' page, but it was edited by 'Mrs Jellaby', the pseudonym of a male journalist,[10] and it included little political content, focussing on fashion and the home. Even though it is clear that some letters to the editor were written by women, pseudonyms obscured authorship in many cases. Hence, newspaper accounts of the 1893 election are largely from the perspective of the established and partisan male journalist and voter.

The papers' partisanship extended to women's suffrage and editorial attitudes towards women's involvement in electoral politics shaped reportage. The *Lyttelton Times* treated the issue seriously, and although one correspondent congratulated the paper on its balanced stance, it would be more accurate to say the *Lyttelton Times* gave half-hearted support to women's suffrage. Kate Sheppard called it a 'quiet resistance.'[11] The *Press* consistently opposed women's suffrage.

As a consequence of these editorial attitudes, many of the comments on women's involvement in politics were patronising and teasing. The *Press'* Saturday column, 'Searchlights', penned by O. T. J. Alpers under the pseudonym the 'Bohemian',[12] repeatedly mocked women for their interest in politics. One of his jokes is reproduced below. It emphasised men's political superiority to women by stressing women's lack of real political interest in a jocular tone. Men would not be swayed from their true opinions by a new hat. In another column, 'Bohemian' suggested that liberating a mouse at the polling booth might keep women voters away. He went on to commend those, both politicians and other groups, who were offering education to new women voters, but gave women the following advice.

> Dear newly-enfranchised, don't you take any of it. Your heads are a good deal better than those of beer-drinking, baccy-pulling man. Just you judge for yourselves, and cast your vote as you make up your minds.[13]

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[10] Chanel Hughes, 'Dolce Cabot and the Canterbury Times 'Ladies Page': An Examination of Early New Zealand Women's Journalism' (MA Thesis, University of Canterbury, 1998). Maud Reeves did edit the *Canterbury Times* ladies page in 1889. Fry, *Maud and Amber*, p.11.

[11] *Lyttelton Times*, 20 September 1893, p.2. Sheppard, 'Our First Election,' p.100.

[12] My thanks to Ruth Fry for identifying 'Bohemian'.

[13] 'Searchlights', *Press*, 14 October 1893, p.7

The following joke was published in the *Press* prior to the election. 'Bohemian' poked fun at a husband unused to a woman of opinions, and at a wife who so easily compromised her principles for a new hat.

Bohemian, 'Searchlights', *Press*, 7 October 1893, p.7

MR JOHN JONES – "Of course, my dear, you'll vote as I do – for Mr Twentyquid.
Mrs John Jones – I shan't do anything of the kind – there! Mr Twentyquid, indeed – a drink man and a free thinker too – the odious creature!
He – "Adjective women's rights! – fads and superstitions – master in his own house... (buries his nose and his language in the newspaper).

* * * *

She – John, dear (grunt audible) – a – did you see that love of a bonnet Mrs S. has got? Such a sweet thing – a perfect poem in millinery.
He – Hang the – humph! (reflects a moment – then briskly). My dear – you know you are twice as pretty as Mrs S. any day – would you like to have one?
She (astounded) – No, really John? You don't mean -
He – I do, by Jove – a real swell of a bonnet – a – a - if – a -
She (archly) – Do you know, John, perhaps after all, Mr Twentyquid is not so odious – and if you really want me to *very much*, you know - ?

* * * *

"John Jones, Esq.
Dr. to Hose and Hitchem,
To one Spring Bonnet, 75s.
A cheque will oblige."[14]

As new voters, women's behaviour was constantly remarked upon in the newspapers. The novelty of their participation in electoral politics was used to emphasise their difference. Metaphors applied to women voters emphasised their recent entrance into electoral politics. One editorial referred to the 'prentice hand' of the 'newly fledged' woman voter.[15] Another emphasised that 'Women are naturally timid, they look very carefully before they leap...'[16] Such comments reinforced women's otherness and consolidated women's status as newcomers, outside 'malestream' politics. Newspaper editors revealed what Kristi Anderson, in a study of United States politics, called 'the male political establishment's persisting resistance' to change.[17] Through their comments, newspaper editors defended the masculinist politics in which the newspapers were players.[18] There was, however, a tension in

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[14] Speechmarks and italics as in original. 'Searchlights', *Press*, 7 October 1893, p.7.

[15] *Lyttelton Times*, 17 November 1893, p.4.

[16] *Lyttelton Times*, 8 September 1893, p.4.

[17] Kristi Anderson, *After Suffrage: Women in Partisan and Electoral Politics before the New Deal* (Chicago and London: University of Chicago Press, 1996).

[18] Marilyn Lake noted the importance of the defence of 'masculinism' in Australia. Marilyn Lake, 'The Politics of Respectability: Identifying the Masculinist Context,' in *Debutante Nation: Feminism Contests the 1890s*, ed. Susan Magarey, Sue Rowley, and Susan Sheridan (St Leonards, New South Wales: Allen and Unwin, 1993).

newspapers' accounts, an ambivalence about changing ideals. Newspaper accounts worked to both keep women on the margins of politics and to co-opt women and women's votes in pursuit of their own agendas. This tension echoes that seen in debates over changing ideals of femininity traced in the previous chapter. The 'New Woman' was as important as the guardian of the home. Women's responses to media attitudes seldom appeared in the mainstream press, but were likely to span the spectrum from acceptance to resistance. Bridget Waldron has suggested that magazines of the period acted as both agents of socialisation and trend followers, and it is important to note that women may or may not have agreed with remarks made in the papers.[19] Kate Sheppard admitted there had been some 'ungallant remarks' and offered her own advice to new women voters.[20] However, women's activities in the Christchurch election campaign received a great deal of press because of commentators' attention to women. As the rest of this chapter indicates, women enthusiastically took part in the Christchurch campaign despite the comments of the newspaper editors.

The Campaign Begins: Registration

The lead-up to the election was characterised by great excitement over the passing of women's suffrage, and women's entry into electoral politics. The first step for new women voters was registration, a pre-requisite for casting a vote. Registration required filling out the appropriate form and submitting it to the Registrar of Electors. All British citizens aged 21 and over who had resided in an electorate for three months or more were eligible for registration (with the exclusion of aliens, criminals and lunatics). Interest in women's registration and voting rate was high, and Christchurch newspapers published regular updates on the number of women who had registered throughout New Zealand. Newspaper editors, politicians and suffragists all called on women to register and vote to make sure that all kinds of women were represented. The *Lyttelton Times* went so far as to print the official Claim for Enrolment.[21] The men's rolls had been prepared for the 1890 election, and were not updated, with only new male voters required to register. Consequently, the need for women's registration dominated reports.

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[19] Bridget Waldron, 'Representing Women: A Study of Selected Women's Magazines and Pages in the 1890s' (Long essay submitted in partial fulfillment of the requirements for the degree of B. A. hons., University of Otago, 1990).

[20] [An Unknown Reporter], 'A Chat with the Franchise Superintendent of the W.C.T.U.,' *Prohibitionist* 1893; reprint, *The Woman Question*, p.93.

[21] *Lyttelton Times*, 21 September 1893, p.4. See also subsequent editions.

Registration counts are discussed in Chapter Three. Suffice to say here that in Christchurch City 6710 women registered. This was 73.2% of the 1896 population (no population figures are available for 1893), which was roughly equivalent to women's registration in other city electorates, as shown in Table 2.2. Because the men's rolls had not been fully updated, men's registration figures were inflated, exceeding the eligible population in some electorates, and prohibiting fruitful comparisons. This problem is discussed in more detail in the following chapter.

Table 2.2 Men's and Women's Registration in 1893

Electorate	Number of Adult Women, 1896	Number of Registered Women (Percentage Adult Women)	Number of Adult Men, 1896	Number of Registered Men (Percentage Adult Men)
City of Christchurch	9167	6710 (73.2%)	8037	7902 (98.3%)
Riccarton	2209	1634 (74.0%)	2550	2249 (88.2%)
Avon	2659	1732 (65.1%)	2545	2589 (101.7%)
Lyttelton	2400	1581 (65.9%)	2324	2008 (86.4%)
City of Auckland	9295	6660 (71.7%)	8618	10128 (117.5%)
City of Wellington	9837	7644 (77.7%)	9949	9217 (92.6%)
City of Dunedin	9625	7280 (75.6%)	8061	9292 (115.3%)
Caversham	2161	1552 (71.8%)	1958	1947 (99.4%)
New Zealand Total (n=59, excluding no contest electorates)	152,520	106,004 (69.6%)	183,938	186,454 (101.4%)

The registration process seems to have been largely managed by canvassers sent door to door by the local Registrar of Electors, or by various groups who also set up meetings at which women could register. Many were suspicious of the motives of canvassers and groups. There was concern that those who were opposed to women's suffrage would sabotage the process, and women were warned to post their registration forms personally. The Registrar reported meeting with some women who feared their registration form might not reach its appropriate destination.[22]

Women organised very early to facilitate women's registration and avoid such sabotage. Even before the Governor's assent to the Bill, Christchurch women held an enrolment meeting for women at the appropriately named Oddfellows' Hall on 13 September presided over by Mrs Kate Sheppard and Mrs Newton.

[22] Comments of Mr G. J. Smith, *Press*, 26 September 1893, p.3. *Press*, 4 October 1893, p.2.

ENROL! ENROL!
ENROL!
UNLESS any unforeseen circumstances arise, the women of
New Zealand will be able to vote at the approaching
Parliamentary Elections.
ONE DAY'S DELAY may prevent women from exercising their
right, and to meet the urgent necessity for immediate enrolment
in the Christchurch Parliamentary Electorate, an
"ENROLMENT CONVENTION FOR WOMEN"
Will be Held in the
ODDFELLOWS' HALL[23]

The hall was crowded, and a dozen enrolment clerks were on hand to take registrations. Several hundred registrations were witnessed that evening.[24] A second meeting was held two weeks later on 25 September, attended by over 350 persons. Around half were women. That day 600 women had registered to vote.[25]

Registration was largely of interest to women, since most men had enrolled for the previous election, and it is perhaps not surprising that women, especially those galvanised by the campaign for suffrage, would become involved in the registration of voters. Sheppard had anticipated the flurry that would accompany women's registration as early as 1889 when she advised delegates at the Women's Christian Temperance Union that, in the event of women's suffrage, they should organise meetings on the uses of the franchise and distribute enrolment forms. Some house-to-house visitations to collect women's registrations were apparently attempted by Sheppard in 1893.[26]

A number of partisan and political organisations also facilitated women's registration. These included the Sons and Daughters of Temperance and the Lyttelton Prohibition League. Members of the liquor trade formed a committee to enrol women voters, and agents of the Progressive Liberal Association were enrolling women as voters.[27] The most visible of women's registrations were those collected by the Women's Section of the Canterbury Liberal Association. The Women's Section had been formed as soon as the Electoral Bill became law, seemingly on the initiative of women. It had 50 to 60 members initially, and a committee of twelve. Rooms were taken in the centre of town, from which registration forms were available for women of any political persuasion. By the end of September, the

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[23] *Lyttelton Times*, 13 September 1893, p.1.

[24] *Lyttelton Times*, 14 September 1893, p.5.

[25] *Lyttelton Times*, 26 September 1893, p.2, *Press*, 26 September 1893, p.3.

[26] Judith Devaliant, *Kate Sheppard: A Biography* (Auckland: Penguin Books, 1992), pp.34,124.

[27] *Lyttelton Times*, 26 September 1893, p.1, 30 September 1893, p.3, 7 October 1893, p.2.

'indefatigable' efforts of the section had resulted in the enrolments of 1000 women, and an Association membership of 200.[28]

Electoral Organisation, Meetings and Canvassing

As new voters, women dominated the registration process. The second stage of the election campaign focussed on promoting candidates through meetings and canvassing. Women's activities continued to receive attention from the newspapers. Women organised separately from men, and candidates encouraged this by holding separate meetings for women electors.

Women's organisations played a part in campaigning, but not in every political organisation. Newspaper accounts suggest that the Canterbury Liberal Association was the only political organisation to have an active women's section. Despite the Licensed Victuallers' efforts to enrol women, I found no evidence women organised against prohibition.[29] A 'deputation of ladies' had called on the Progressive Liberal Association to support the claim for women's franchise prior to the granting of women's suffrage, but the Association was slow to encourage women to join. It was not until 12 October that they held a women's meeting to establish a women's section of the Association, but the activities of the section received little comment in the newspapers. In fact, reports suggest that women may have joined the main committee, rather than having a separate section of their own. Lack of further details precludes any further comment, except to say that if such a strategy was followed, it attracted less attention than the Canterbury Liberal Association strategy of a separate women's section.[30]

The success of the Women's Section of the Liberal Association may have resulted from the ability of its two leaders, Maud Reeves and Aileen Garmson, to mobilise support for the Liberal cause. Maud Reeves' part in the election was commented on by Sir John Hall, who argued that her attention to women voters 'was largely instrumental in placing her husband at the head of the poll.'[31] As a leader in the local suffrage movement and wife of the Minister of

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[28] *Lyttelton Times*, 23 September 1893, p.5, 25 September, p.6, 30 September 1839, p.3,6.

[29] *Lyttelton Times*, 26 September 1893, p.1, *Press*, 10 October 1893, p.4.

[30] *Christchurch Star*, 14 September 1893, p.5; 30 September 1893, p.6, *Lyttelton Times*, 7 October 1893, p.2, 13 October 1893, p.5, 26 October 1893, p.1.

[31] Quoted in Jean Garner, *By His Own Merits: Sir John Hall - Pioneer, Pastoralist and Premier* (Hororata: Dryden Press, 1995), p.262.

Labour, Maud Reeves must have activated social networks to her husband's benefit.[32] Aileen Garmson was a far more controversial figure. She was active in Union circles, and a member of the Knights of Labour, constantly criticised for her public activities. [33]

Members of the Liberal Women's Section had a dual agenda – to promote Liberal policies and candidates, but also to promote the perspectives of Liberal women. Aileen Garmson, secretary of the Section, pushed the Liberal programme, calling upon members 'to sink all minor questions and return men pledged to work for the good of the greatest number.'[34] Another member of the committee, clearly frustrated by the Association's failure to include women in the process of candidate and policy selection, wrote to the *Lyttelton Times*:

> SIR,- We, as women, have no right to have Messrs Collins and Sandford[35] dictated to us, merely because the Liberal Association have chosen them. It would be better for us to hear them from our own platform... Surely before the candidates can expect the women to work for them, it is due as a matter of courtesy for them to come to our platform to give us the opportunity to question them.[36]

This member stressed the separateness of the Women's Section from the rest of the Association, and the existence of a policy platform specific to Liberal women. Aileen Garmson was quick to reply, denouncing the committee member for 'flying into print.'[37]

Without records from the Section itself, it is hard to determine how much conflict existed in the organisation between women's politics and Liberal politics, or between men and women. Accounts of women's part in political parties in later years suggest that male members have been reluctant to give women's sections much power in the organisation, [38] and the letter cited above indicates that at least one member of the Liberal Women's Section was unhappy with the Section's relationship with the candidates selected by the Canterbury Liberal Association. The role of women in the Liberal Association was largely a supportive one, as they facilitated

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[32] Fry, *Maud and Amber*, especially p.23.

[33] Bronwyn Labrum, 'Aileen Garmson,' in *Book of New Zealand Women: Ko Kui Ma Te Kaupapa*, ed. Charlotte Macdonald, Merimeri Penfold, and Bridget Williams (Wellington: Bridget Williams Books, 1991).

[34] *Press*, 12 October 1893, p.6.

[35] Two of the three candidates selected by the Association. The third was William Pember Reeves.

[36] *Lyttelton Times*, 14 October 1893, p.2.

[37] *Lyttelton Times*, 16 October 1893, p.6.

[38] Liz Gordon, 'A Place in the Sun: Women in the New Zealand Labour Party,' (1988) Unpublished manuscript; Melanie Nolan, 'Gender and the Politics of Keeping Left: Wellington Labour Women and Their Community, 1912-1949,' in *Communities of Women: Historical Perspectives*, ed. Barbara Brookes and Dorothy Page (Dunedin: University of Otago Press, 2002).

women's registration and canvassed for candidates chosen by the Association. The identities of other members of the Liberal Section are unknown, but both Mrs Garmson and Mrs Reeves were strong personalities. Their apparent acquiescence with the role of registration and canvassing probably reflected their partisanship: Maud Reeves for her husband, and Aileen Garmson for the Liberal cause.

Although they played a supportive role, candidates' committees were vital in the election process. These committees existed quite separately from the allied partisan organisations such the Canterbury Liberal Association. Reeves, Sandford and Collins were all supported by this Association; but although Reeves and Sandford worked together, utilising joint committees, Collins ran his campaign separately. The role of candidate committees was not to do with setting policy, a task seemingly left to the candidates themselves and the partisan organisations. Candidates' committees focussed on promoting the candidate by organising meetings where the candidate addressed electors, and canvassing. Many candidates had a number of suburban committees, of which women were members. W. W. Tanner, a candidate for Avon, had five committees, comprising 102 individuals, working for him.[39]

As in other aspects of electoral politics, women's part in the campaigns for candidates was often separate from men's. A number of candidates had separate ladies' committees. Aileen Garmson was the president of Tanner's Linwood Ladies Committee. Mrs Williams was Vice-President and Mrs Tanner took the position of secretary. The forty ladies of this committee assisted Tanner's campaign.[40] Reeves' efforts to attract women supporters seem to have been taken in hand by his wife Maud. Keith Sinclair called her 'an ally of previously unsuspected strength.'[41] There is some evidence that membership of Reeves' committee carried some kind of social prestige. 'Electress' complained when membership of candidate committees was opened to all-comers:

> I read with the greatest astonishment the announcement that both sections of the Canterbury Liberal Association are requested to join the committees of Reeves, Collins and Sandford. Now at Mr Reeves meeting of friends and supporters held last Thursday evening, that gentleman said "those who give in their names tonight will be on my committee," and then he proceeded to give us to understand that his committee would not be joined with any others. – I am, &c., ELECTRESS[42]

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[39] *Lyttelton Times*, 10 November 1893, p.3.

[40] *Lyttelton Times*, 18 October 1893, p.4.

[41] Sinclair, *William Pember Reeves*, p.189.

[42] *Lyttelton Times*, 19 October 1893, p.6.

Newspapers provide little detail of the activities of opposition candidates' committees. This seems to reflect the fact that conservative candidates were less active in the campaign. Indeed, there was general disappointment at the quality of conservative candidates in Christchurch.[43] By early October, some women were expressing 'grave doubts as to the merit of our present candidates.' A number of women organised to correct this state of affairs. A meeting was arranged for women electors dissatisfied with those candidates. Options were discussed by the fifty women present at the meeting, and a petition organised. The *Press* reported that the canvassers had collected the signatures of 1237 women on a petition that asked Sir John Hall to stand for Christchurch.[44]

The petitioners recognised that they owed to Hall, as a major instigator of women's suffrage, the power to make the appeal, but the petition stressed Hall's political experience and integrity. The accounts suggest that there were religious and class factors in the appeal: the petitioners emphasised that they did not support freethinkers or socialists. Yet this was certainly a women's appeal. Mrs Packe and Miss Torlesse assured Hall that there were a number of men ready to assist with a campaign, but there was no evidence that men petitioned Hall. Unfortunately the petitioners were to be disappointed. Hall admitted to being worn out from years of politics and did not accede to their request.[45] Nonetheless, the women had organised politically by forming a committee, holding meetings, and canvassing electors, suggesting that women's participation and opinions were not limited to one side of the political spectrum.

Canvassing had been a tactic used by suffragists soliciting signatures for the suffrage petition. It is clear that women canvassed during the 1893 election campaign. The Riccarton candidate William Boag was supported by his wife and other ladies who called round the district.[46] Maud Reeves also assisted her husband, 'moving around quietly', calling on electors, and even encouraging rumours that might aid his campaign.[47] Accounts of election day revealed women were active at the booths, appealing to voters.[48] Newspaper comments on canvassing

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[43] *Press*, 5 October 1893, p.3, 21 November 1893, p.3, *Lyttelton Times*, 17 November 1893, p.4, 22 November 1893, p.4.

[44] *Press*, 6 November 1893, p.3, 17 November 1893, p.3,5. *Lyttelton Times*, 8 November 1893, p.2, 17 November 1893, p.6.

[45] *Press*, 17 November 1893, p.5, *Lyttelton Times*, 17 November 1893, p.6.

[46] *Lyttelton Times*, 24 November 1893, p.2.

[47] Sinclair, *William Pember Reeves*, p.189.

[48] *Press*, 29 November 1893, p.5.

were often uncomplimentary and discouraging. One correspondent to the *Lyttelton Times* called wives' canvassing a 'peculiar tactic',[49] and when discussing women's canvassing a few days after the election, the *Lyttelton Times'* editor suggested that its 'undignified and degrading consequences... could only be dimly foreshadowed in a one-sided struggle like the late general election.' 'It is not altogether seemly to have women accosting strangers and arguing with them in the public street.'[50]

Candidates' wives and ladies' committees also supported candidates at meetings by presenting motions of thanks and of confidence in the candidate. Women supporters decorated halls and presented speakers with bouquets of flowers. Sometimes their tactics backfired. The efforts of some of Mr Boag's women supporters to supply afternoon tea at an afternoon meeting had to be abandoned because it was feared it might be considered 'corrupt practice.'[51] Women's activities at meetings were not always supportive. Women also asked questions and heckled at meetings. '[A] lady who had been interrupting at frequent intervals was remonstrated with by the Chairman' at an Avonside electoral meeting.[52]

It was common for candidates to meet with women separately, sometimes under their own auspices and at other times at the request of women. Some of these separate meetings were designed to give women some education on political matters. Eden George, the Christchurch mayor and an unsuccessful election candidate, advised women on the voting procedure at one meeting.[53] However, women were also given special treatment at ordinary meetings where separate seating was provided for 'lady electors,' often in the gallery. Newspaper accounts of such meetings usually commented on the number of ladies in attendance, be it 'a large number' or merely 'several.'

Women's participation at meetings received similar censure to their canvassing. The *Press* reported that Eden George was given a 'high old time' by women clearly unafraid to assert their opinions at his meeting for women electors. 'Bohemian' was uncomplimentary:

> Some of the political Amazons not merely refused to give [George] a hearing, but shrieked Billingsgate at him, interrupted him with cries of "silly nonsense" and

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[49] *Lyttelton Times*, 10 November 1893, p.3.

[50] *Lyttelton Times*, 7 December 1893, p.4.

[51] *Lyttelton Times*, 16 November 1893, p.6, 17 November 1893, p.2, 22 November 1893, p.2. *Press*, 14 November 1893, p.2, 16 November 1893, p.5.

[52] *Lyttelton Times*, 31 October 1893, p.6.

[53] *Press*, 27 September 1893, p.6.

> "bunkum," and even shook their ginghams in his face. It was in vain he pathetically appealed to their chivalry as "an unprotected he-male."[54]

Reeves was also uncomplimentary, though he emphasized women's lack of spunk rather than an excess of it in his later accounts of the election. In *State Experiments in Australia and New Zealand*, Reeves suggested that women's presence at electoral meetings was 'sombre', 'impassive' and 'irresponsive'. 'Far from displaying hysterical emotion', women made only 'fluttering, half-audible little speeches.'

> Careful coaching was needed to persuade [women] to clap their hands... She was a bold woman who taught her sex what might be done with the waving of handkerchiefs.[55]

Reeves' memory must have been short. It was reported that women had waved their handkerchiefs and men their hats amid a 'storm of cheers and applause' at Reeves' own Christchurch campaign meeting,[56] and Reeves' descriptions bear little resemblance to the activities of Mrs Garmson, or Reeves' wife Maud. Reeves had himself discouraged women's involvement at meetings. When Aileen Garmson stepped forward to second a vote of thanks to and confidence in William Pember Reeves at his meeting on October 30, Reeves motioned her back to her seat, and a Mr Kelly seconded the motion instead.[57]

However, Reeves' behaviour and journalists' comments reflected widely held notions about what kind of behaviour was appropriate for women, who were supposed to be gentle and restrained in public, rather than behaving like 'political Amazons'. Women who broke the rules were criticised. Publicly active women like Aileen Garmson were frequently mocked with epithets like 'shrieking sisterhood', or told they were unwomanly. Others, like Kate Sheppard, worked hard to maintain a 'quiet, womanly manner' when discussing politics.[58] While some women found the commotion of political meetings discouraged them from speaking out,[59] comments like those made by Reeves largely obscure the participation of women at the 1893 election, rather than reflecting women's obscurity during the campaign.

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[54] *Press*, 30 September 1893, p.6.

[55] William Pember Reeves, *State Experiments in Australia and New Zealand* Volume I (London: George Allen and Unwin, 1923), pp.113,121.

[56] *Lyttelton Times*, 31 October 1893, p.5.

[57] *Press*, 31 October 1893, p.3.

[58] [An Unknown Reporter], 'A Chat with the Franchise Superintendent,' p.93. See also Sandra Coney, *Standing in the Sunshine: A History of New Zealand Women since They Won the Vote* (Auckland: Penguin Books (NZ) Ltd, 1993), p.14-15.

[59] *Lyttelton Times*, 3 November 1893, p.2; 25 November 1893, p.3; 27 November 1893, p.3.

Although Mrs Garmson was unable to thank Reeves at his meeting, she seconded a vote of thanks to Richard Seddon when he spoke in the city.[60]

Such evidence suggests that political organisation worked to confirm gender differences in the sphere of politics. Women's part in electoral organisation and campaign meetings reflected the structure of politics prior to women's enfranchisement. Women continued to organise and meet separately, but they did so under the umbrella of political organisations, the most visible of which was the Women's Section of the Canterbury Liberal Association.

Women were both enthusiastically present and marginalised. Women clearly preferred to organise as women, but were encouraged to do so by the resistance of the media and of some candidates to women's electoral participation. Gate-keeping by the media and candidates did not prevent women's participation. Instead it may have simply reinforced women's separateness in the campaign, and certainly reinforced women's identity as women voters, other than men. Moreover, although women may have been discouraged from canvassing and other 'unwomanly' behaviour, they were not discouraged to vote.

The evidence suggests that women's partisan organisations promoted partisan and women's politics, with the partisan aspect coming first. The existence of women's partisan organisations does not seem to have reflected a widespread concern amongst those women for women's issues identified in the suffrage campaign. Patricia Grimshaw has noted that suffragists were split in their attitudes regarding women's involvement in electoral politics. Some believed women should organise as women, and others believed that women should join existing political parties.[61] Christchurch women chose a kind of middle ground, organising as women under the umbrella of political organisations. This middle ground reflects the ongoing tension between the separation and integration of men and women that has influenced women's role in political and other organisations in New Zealand and overseas. Researchers who have considered women's involvement in New Zealand political parties in later years found the same kind of tension. Accounts of the Labour Party stress that women had to work hard to gain influence in the party in the early and middle twentieth century.[62] What is clear from the newspaper accounts of the 1893 election in Christchurch is

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[60] *Lyttelton Times*, 28 November 1893, p.6.

[61] Patricia Grimshaw, *Women's Suffrage in New Zealand* (Auckland: Auckland University Press, 1987), pp.97-98.

[62] Gordon, 'A Place in the Sun'; Susan Jane Kedgley, 'Ladies in the Backroom: A Study of Women Party Activists in the National and Labour Parties' (Master of Arts, University of Otago, 1972); Nolan,

that women did enthusiastically participate in the election campaign. On balance, separate organisation seems to have facilitated women's involvement in the campaign.

Opinion Claiming, Shaping and Making

The third aspect of the election campaign was its content, that is the issues and opinions that dominated the campaign. Unfortunately, the content of women's meetings was seldom reported on. However the comments of candidates, newspaper columnists and letters to the editor suggest that some issues were viewed as women's issues.

It is clear that suffrage itself was an issue. Candidates' speeches often began with congratulations to women for winning the franchise. Reeves' rather back-handed compliment was typical. He suggested that 'a large number of women were quite as capable of exercising their votes as men.'[63] However, the extent of candidates' support for women's suffrage was an issue for electors. Kate Sheppard reminded women to support those who had fought for the franchise, and candidates who had opposed it were castigated if they changed their minds. Those who had opposed suffrage, or who remained 'fair-weather friends', were outed by a *Lyttelton Times* correspondent.[64] Other historians have suggested that the vocal opponent of women's suffrage, Henry Fish, most likely lost his Dunedin seat due to women's votes.[65] In Christchurch, there were no real opponents. Reeves did not seem to have suffered for his lukewarm support of the franchise.

'Gender and the Politics of Keeping Left.' For overseas examples see Anderson, *After Suffrage;* Melanie Gustafson, Kristie Miller, and Elisabeth Israels Perry, *We Have Come to Stay: American Women and Political Parties, 1880-1960* (Alberqueque: University of New Mexico Press, 1999); Anna L. Harvey, *Votes without Leverage: Women in American Electoral Politics, 1920-1970* (New York and Cambridge: Cambridge University Press, 1998); David Jarvis, 'The Conservative Party and the Politics of Gender, 1900-1939,' in *The Conservatives and British Society, 1880-1990*, ed. Martin Francis and Ina Zweiniger-Bargielowska (Cardiff: University of Wales Press, 1996).

[63] *Press*, 31 October 1893, p.3.

[64] Sheppard, 'Our First Election,' p.96; Kate Sheppard, 'Wolves in Sheep's Clothing,' *Prohibitionist*, 4 November 1893; reprint, *The Woman Question*, pp.97-98. *Lyttelton Times*, 20 October 1893, p.2, 31 October 1893, p.2.

[65] Neill Atkinson, *Adventures in Democracy: A History of the Vote in New Zealand* (Dunedin: Otago University Press, 2003), pp.90,98; Coney, *Standing in the Sunshine*, p.33; Grimshaw, *Women's Suffrage in New Zealand*, p.104.

References to women's suffrage were generally only a small part of candidates' speeches. The large part dealt with issues of land, taxation and the railways, and these were the issues to which newspaper editors paid the most attention. There was, for example, dissension over the Liberal policy of borrowing, and as others have noted the land and tax questions were hotly debated. The railways issue was really a local one regarding the construction of the Midland Railway across the South Island, but the role of the government in railway management was also hotly debated. In general these topics were not directed to either sex, although discussion of land policy sometimes included reference to the manly pioneer. Reverend O'Hoare was cheered when he stated that 'every man had a stake in the country'[66] while W. W. Collins suggested that the Liberal government had 'manfully grappled with the land question.'[67] These issues were mostly framed in terms of the good of the country as a whole, rather than appealing to either men or women. [68]

Workers' issues featured to a lesser extent.[69] Reeves faced a meeting of unemployed workers, engineered by Eden George, and discussions centred around getting work for those men rather than the policies Reeves hoped to promote as Minister of Labour.[70] The relationship between the Bootmakers' Union and Tanner's campaign created some discussion.[71] A number of correspondents called on workers and their wives to support pro-labour candidates. There is evidence that some women based their political opinions on their family situation. 'A woman of the people' told *Lyttelton Times* readers that

> Now we women have a vote we intend to have our husbands and sons at work. Yes, and our daughters too... I have been called one of the 'shrieking sisters', but I mean to shriek out Protection and work for our people.[72]

However, appeals to women's labour sympathies were as likely to be framed in terms of women's opposition to sweating as they were to appeal to workers' wives' sympathies with

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[66] *Press*, 25 October 1893, p.3.

[67] *Press*, 4 November 1893, p.9.

[68] For further information on the debate over the Liberal platform see Downey, 'The 1893 General Election'.

[69] Downey, 'The 1893 General Election', p.249; David Hamer, *New Zealand Liberals: The Years of Power* (Auckland: Auckland University Press, 1988), p.107.

[70] *Lyttelton Times*, 17 October 1893, p.6, 19 October 1893, p.2. *Press*, 17 October 1893, p.6, 18 October 1893, p.5, 19 October 1893, p.6.

[71] *Lyttleton Times*, 25 November 1893, p.6.

[72] *Lyttelton Times*, 9 October 1893, p.2. See also *Lyttelton Times*, 3 October 1893, p.2 for another letter on freetrade and protection from the same correspondent.

their husbands.[73] Notions about the appropriate roles for men and women threaded through labour debates as much as through land debates.

Reeves despaired at most voters' indifference to the Liberal platform regarding land and labour. After being forced to deal with religious education, prohibition and various local questions, Reeves insisted on discussing the Liberal platform, despite the apparent reluctance to listen.[74] Reeves' despair was echoed by newspaper editors and correspondents who lamented the attention to fads, namely prohibition and education, which they associated with women. Bohemian's joke about Mr and Mrs John Jones, her hat, and their views was typical. Aileen Garmson, who was a tireless labour advocate, stressed the same point to women of the Liberal Association. She

> warned the women of Christchurch against interfering with the present Education Act in any way, or of being led away by men of one idea, whom she denounced as being traitors to the Liberal Party.[75]

Advocates of prohibition and religious education were of course more likely to argue it was not fads interfering with party politics, but party politics interfering with important social questions.[76] The suffragists' claims that women had a particular interest in social issues was repeated throughout the election campaign. Policies were perceived to be gendered: women were associated with social issues, such as prohibition, education, and old-age pensions. These issues were 'other' to the main issues of land and tax. The *Press* would refer to one candidate as a 'true Liberal of the masculine type' because he did not focus on social issues. [77]

In fact, both prohibition and religious education were prominent election issues, important enough for the *Press* to list the opinions of candidates throughout the nation on these issues.[78] Downey has suggested that candidates' attitudes to prohibition largely determined who would win the Canterbury seats: it was mostly moderates that won the seats.[79] The prominence of prohibition and education in election debates suggested that the hopes of temperance suffragists that social issues would receive more attention were largely realised.

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[73] *Lyttelton Times*, 9 September 1893, p.2, 15 September 1893, p.2, 26 September 1893, p.2, 14 November 1893, p.2, 23 November 1893, p.5.

[74] Sinclair, *William Pember Reeves*, pp.187-188.

[75] *Press*, 12 October 1893, p.6.

[76] *Press*, 28 October 1893, p.10.

[77] *Press*, 13 October 1893, p.4.

[78] *Press*, 28 November 1893, p.6. Note that the *Press* list did not distinguish between the supporters of bible in schools and supporters of grants in aid to Catholic Schools.

[79] Downey, 'The 1893 General Election', p.204.

This increased attention was not simply due to women's interest in those issues, but reflected a general interest. Reeves' audiences who were so keen to hear about prohibition and religious education included both men and women. While proponents of some issues used the connection between women and the social and moral to promote their views, it did not necessarily follow that women's, or men's, opinions fell one way on social issues. In other words, the connection between women and temperance and religious education did not either prevent men from supporting these issues, or women from opposing them. The evidence suggests that women and men had diverse opinions.

Depending on the side one took, there was great fear and hope that women would vote for prohibition. Temperance advocates exploited the connection between women and prohibition, appealing specifically to women on the issue. One temperance advertisement insisted that 'LADY ELECTORS now have a Vital Power in the Settlement of this Question.'[80] A speaker on the prohibition platform hoped that 'women would vote as one man' for prohibition.[81] Undoubtedly the prominence of the Women's Christian Temperance Union in the campaign for suffrage had helped link women's votes with the prohibition, and temperance suffragists continued to push the point in the lead-up to the election.[82] Accordingly, husbands, like Mr John Jones, were often called upon by anti-prohibitionists to counteract their wives' prohibitionist tendencies. 'A True Liberal' told husbands to tell their wives to 'do something sensible' which was to vote for Liberal candidates, not prohibitionists.[83]

In fact the debate was not over prohibition itself, or even over popular vote on the issue which was allowed for by the Alcoholic Liquors Sale Control Act passed prior to the election. The question in 1893 was whether a bare majority or a three fifths majority should be required to pass prohibition in local districts. Temperance advocates, labelled 'prohibitionists', favoured the bare majority. Others supported the government compromise that required the larger majority.[84] The lines were not clear, however, as W. W. Collins, himself a teetotaller, angered

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[80] Capitals in original. *Press*, 4 November 1893, p.1.

[81] W. Earnshaw speaking at a direct veto meeting in Christchurch. *Press*, 18 October 1893, p.5. See also 'Little New Zealand Leads the Way', *Prohibitionist*, 23 September 1893, p.6.

[82] [An Unknown Reporter], 'A Chat with the Franchise Superintendent,' p.92.

[83] *Lyttelton Times*, 23 September 1893, p.6

[84] Hamer, *The New Zealand Liberals*, pp.115-119.

the prohibitionists by arguing against most prohibition measures which he saw as a breach of individual freedom.[85]

It is clear that a number of women supported and agitated for prohibition. The Women's Christian Temperance Union page in the *Prohibitionist* insisted it was vital to vote for those who would repeal the Alcoholic Liquors Sale Control Act.[86] Three women caused great annoyance at one Christchurch booth on election day by canvassing for the candidates who supported prohibition[87] and a correspondent to the *Times* lamented the 'oily tongue of female canvassers' for prohibition.[88] This evidence suggests that it was more common for women to publicly support prohibition than otherwise, but we cannot know for sure. It is clear that some women were opposed to prohibition. The Licensed Victuallers were relieved to report that a large number of women said to be opposed to prohibition had enrolled.[89] According to the *Lyttelton Times,* one prohibitionist so annoyed a 'lady on the other side' on election day that

> the lady at once chartered a cab and expressed her determination of 'sticking to him' throughout the day, and following him about in order to undo the effect of his representations.[90]

Men's views also fell on both sides of the question. Some men such as Collins and William Pember Reeves staunchly opposed prohibition measures. Yet while drinking was associated with masculinity, historians have also noted that temperance, or self-control. was also promoted as a 'masculine virtue.'[91] The Progressive Liberal Association, whose members were keen to promote prohibition, was established by men. The loudest Christchurch prohibition campaigners were also men, the vehement Tommy Taylor and the Reverends L. M. and F. W. Isitt, who frequently addressed mixed meetings on the topic.

Some prohibitionists were concerned that women voters might privilege the issue of religious education over prohibition.[92] The religious education question was complex, and split by denomination as much as political leaning. Catholics and some Anglicans were canvassing for grants in aid to church schools, a claim that was not popular outside those circles. Members of

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[85] *Prohibitionist*, 4 November 1893, p.11; 9 November 1893, p.9.

[86] *Prohibitionist*, 4 November 1893, p.3.

[87] *Lyttelton Times*, 29 November 1893, p.5.

[88] *Lyttelton Times*, 24 November 1893, p.2.

[89] *Press*, 26 September 1893, p.4.

[90] *Lyttelton Times*, 29 November 1893, pp.4-5.

[91] Jock Phillips, *A Man's Country? The Image of the Pakeha Male*, Revised ed. (Auckland: Penguin Books (NZ) Ltd, 1996), p.63.

[92] *Prohibitionist*, 25 November 1893, p.8.

Protestant denominations, including some Anglicans, promoted instead a bible in schools programme, believing that secular education failed their children. A public meeting of the Christchurch Scripture Text-Books in Public Schools Association held in October was largely attended and committee meetings where ministers from a number of Protestant denominations met to discuss appropriate textbooks were fully reported on in the newspapers.[93]

Opinions expressed by correspondents to the newspapers suggested that many people, including women, supported the secular system of education that Reeves advocated as Minister of Education.[94] The Lyttelton Knights of Labour advised its members to vote for candidates that supported the present system.[95] However, many people did associate religious education with women. Seddon appealed to 'the ladies' when he discussed the education question at a large Christchurch meeting.[96] 'A mother's' advocacy of secular education brought impassioned responses since it severed the link between femininity and concern for welfare and religion. One critic of her views claimed that

> Such mothers do but bring discredit on womanhood. No woman can live the life of a true mother, with and for her children, without feeling a daily deepening conviction of the need for feeding their spirituality equally with their mental and bodily growth...[97]

The issue of religious education brought clergy into the election campaign. Both the Anglican and Catholic bishops appealed to women voters. Bishop Julius circulated a pastoral letter to Anglican parishes, encouraging women to vote, even if they were personally opposed to the franchise for women.[98] The Catholic Bishop Grimes echoed these sentiments, but went further, advising women how to vote. At a special meeting, Grimes appealed to the maternal instincts of the 4-500 Catholic women present. He advised them to

> sacrifice any personal considerations, and first begin by registering at once and when the time came to vote they must consider the interests of their children, which they wished to see brought up in schools where the name of God was not set aside. They were not to pledge themselves to any candidate, but to look to their bishop and priests...[99]

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[93] See for example *Press*, 27 October 1893, p.5.

[94] *Lyttelton Times*, 11 October 1893, p.2, 12 October 1893, p.6, 13 October 1893, p.2, 16 October 1893, p.6.

[95] *Lyttelton Times*, 7 November 1893, p.5.

[96] *Press*, 27 November 1893, p.3.

[97] *Lyttelton Times*, 16 October 1893, p.6. See also *Lyttelton Times* 11 October 1893, p.2, 12 October 1893, pp.2,6, 13 October 1893, p.2.

[98] *Star*, 2 October 1893, p.1.

[99] *Press*, 2 October 1893, p.5.

Bishop Julius preferred the bible in schools programme over denominational education, and although he received criticism from prohibitionists for some of his comments, he focussed on encouraging women to cast a vote.[100] Bishop Grimes' involvement in electoral politics was far more partisan and interested.

Catholics tried hard to get a Catholic block vote on the education issue, targeting both men and women on the issue. A committee had been formed twelve months before the election and the opinions of all candidates regarding Catholic education had been sought. Three candidates with appropriate views, Evison, George and Hoban, had been selected by the committee, and Catholics were told to vote for these candidates. At a secondmeeting, this time for Catholic men and women, Grimes stated that the education question was the most important of all, and should take precedence over any doubts over the characters of the candidates. Grimes told his listeners that

> Any Catholic who did not support them [Evison, George and Hoban] and do his best to secure their return was a coward, a traitor and a craven. He compared those who were endeavouring to bring in any other candidates to Judas Iscariot, and concluded by saying it was his right, as Bishop of the church, and their leader, to command them to vote for the candidates chosen for them.[101]

In fact the characters of the candidates were in doubt. Evison had apparently printed a pamphlet attacking Catholics, and there were allegations he had supported sweating while employed as editor of the *Catholic Times*.[102] The already unpopular Eden George furiously denied the contents of pamphlets 'published on the eve of the election', the nature of the apparently 'untrue statements' made in the pamphlets was not revealed by him.[103]

Correspondents denounced Grimes' command to his congregation, although some disputed that he had actually made the statement in question. Newspaper correspondents insisted that morals did matter, that politics was no place for the church, and that voters, including women, should be able to make up their own minds.[104] Catholic voters may not have followed Grimes' advice. Kirsten Thomlinson found that Catholic women in Caversham were happy to sign the

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[100] *Lyttleton Times*, 4 October 1893, p.2,4, 5 October 1893, p.2, 6 October 1893, p.2.

[101] *Lyttelton Times*, 23 November 1893, p.5. *Press*, 23 November 1893, p.5.

[102] Evison referred to the pamphlet at the Catholic meeting. *Lyttelton Times*, 23 November 1893, p.5. See also *Lyttelton Times*, 23 November 1893, p.2, 24 November 1893, p.2, 27 November 1893, p.6..

[103] *Lyttelton Times*, 27 November 1893, p.1.

[104] *Lyttelton Times*, 4 October 1893, p.2, 24 November 1893, p.2, 27 November p.2. *Press*, 28 November 1893, p.2.

suffrage petition in the face of priestly opposition.[105] Kate Sheppard argued that the defeat of the candidates who supported aid to church schools showed that women were not unduly influenced by the clergy.[106]

The bishops' participation in electoral politics did incite fears that women would fall prey to clergy influence, a claim that was frequently made prior to the election. Sir P. A. Buckley, the legislative councillor told the Council 'Women are more impressionable than men, and they are more in the hands of the clergy'. [107] The nomination of two clerics, Reverends Bradbury and Hoare, had already awakened controversy in Christchurch. Hoare's integrity was put in question, with many suggesting he should resign from his parish before standing for election. The *Lyttelton Times* blamed the 'womanhood vote' for the 'clerical eruption', but thought few male voters would support them.[108]

Reaction to Grimes' statements and concern over Hoare's candidature suggest that voters were more concerned with morality than religion. Other evidence confirms the importance of candidate integrity. There were a number of letters to the editor on the issue.[109] Candidate morality was also a feature of the petition to Sir John Hall. Miss Torlesse said that the request for Hall to stand was not made in any party spirit, but out of concern for the quality of the candidates. The deputation insisted that they did not want to be represented by free thinkers or socialists, but felt confident of Hall's 'Christian statesmanship.' [110] As the Bohemian mocked

> All men respect him for
> Splendid Ability;
> Dames would elect him for
> Moral Stability.[111]

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[105] Annabel Cooper and others, 'The Landscape of Gender Politics: Place, People and Two Mobilisations,' in *Sites of Gender: Women, Men and Modernity in Southern Dunedin 1890-1939*, ed. Barbara Brookes, Annabel Cooper, and Robin Law (Auckland: Auckland University Press, 2003), p.46; Kirsten Thomlinson, 'We the Undersigned: An Analysis of Signatories to the 1893 Women's Suffrage Petition from Southern Dunedin' (MA Thesis, University of Otago, 2001), pp.92-98.

[106] Sheppard, 'Our First Election,' p.100.

[107] Legislative Council. 18 August 1893, *NZPD*, Vol. 81, p.142.

[108] *Press*, 16 October 1893, p.6, 17 October 1893, p.3. *Lyttelton Times*, 6 November 1893, p.6, 25 November 1893, p.5.

[109] *Lyttelton Times*: 20 November 1893, p.6, 22 November 1893, p.2, 24 November 1893, p.2, 27 November 1893, p.2.

[110] *Press*, 17 November 1893, p.5, *Lyttelton Times*, 17 November 1893, p.5. On women and religion see also *Press* 13 October 1893, p.3, 20 October 1893, p.2.

[111] *Press*, 18 November 1893, p.8.

The evidence from the election campaign in Christchurch suggests that opinions were not clearly divided on gender lines. Proponents of religious education and prohibition did try to use the connection between women and social reform forged in the suffrage campaign to mobilise women's votes for their cause, but the evidence suggests that women's opinions were split on these issues, as were men's. There was a wider consensus regarding the importance of candidate morality to women voters, but men also commented on these issues. Women joined together as Liberals and as Conservatives, suggesting that, as for men, women's opinions spread along the party spectrum. In the end, gender criss-crossed political positions since gender difference could be invoked to support a number of different attitudes. As Sheppard suggested

> If we speak of the necessity for reform, of the sacred rights of humanity, it will be said we are advocates of Radicalism; and, on the other hand, if we dwell on the importance of the governing power being in the hands of the more settled and stable part of the community, of the wisdom of extreme caution in the changing of laws that may affect our national prosperity and social well-being, it will be said we are pronounced Conservatives.[112]

Sheppard also suggested that women would vote with their husbands or other male relatives. Without access to conversation in the kitchen and parlour, it is very difficult to assess whether, and if so how much, wives and husbands influenced each other. It is very clear that both men and women had opinions they wished to promulgate. The letters to newspapers instanced above include cases of both men and women attempting to influence others. There are instances where men and women clearly shaped others' opinions and actions. Maud Reeves was able to persuade her husband he should support women's suffrage despite his misgivings. The *Press* reported one man's efforts to assist his wife and daughter at the polling booth. He attempted to accompany his wife into the polling booth at the Provincial Council Chambers.

> The poll clerks removed him. Then he went into where his daughter was recording her vote and wished to instruct her. This also he was also prevented from doing much to his chagrin. "Why," said he to Mr Beetham, "we have no secrets from each other; oughtn't I to tell my wife and daughter how to vote?"[113]

Examination of the results of the election confirm that gender threaded through different political positions. Votes for the various Christchurch candidates are shown in Table 2.3. Reeves, a staunch adversary of prohibition and advocate of secular education led the poll in

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[112] Kate Sheppard, 'To Women Voters,' *Prohibitionist*, 21 October 1893; reprint, *The Woman Question*, pp.93-96.

[113] *Press*, 29 September 1893, p.5.

the City of Christchurch electorate, followed by the leading prohibitionist G. J. Smith, and the free-thinking Liberal W. W. Collins who also opposed prohibition. Liberals topped the polls in the other Christchurch electorates.

Table 2.3 Candidate Votes in four Christchurch Electorates[114]

Electorate	Candidate	Party Affiliation	Number Of Votes	Percentage of Electorate Votes
City of Christchurch	W.P. Reeves	Liberal	5442	16.60%
City of Christchurch	G.J. Smith	Liberal Prohibitionist	4510	13.80%
City of Christchurch	W.W. Collins	Liberal	3875	11.80%
City of Christchurch	E. Sandford	Liberal	3594	11.00%
City of Christchurch	J.O'B.R.D Hoare	Liberal Prohibitionist Religious Teaching (State Schools)	3098	9.50%
City of Christchurch	C.H. Bradbury	Liberal Prohibitionist, Religious Teaching (State Schools)	2937	9.00%
City of Christchurch	R.M. Taylor	Liberal	2037	6.20%
City of Christchurch	W. Hoban	Liberal Religious Teaching (Catholic)	1976	6.00%
City of Christchurch	M. Davie	Opposition	1846	5.60%
City of Christchurch	J.S. Evison	Opposition Religious Teaching (Catholic)	1753	5.40%
City of Christchurch	E. George	Independent Religious Teaching (Catholic)	1647	5.00%
Avon	W.W. Tanner	Liberal Prohibitionist	1719	53.90%
Avon	G. McIntyre	Independent Prohibitionist Religious Teaching (Catholic)	1066	33.40%
Avon	J.L. Wilson	Opposition Prohibitionist Religious Teaching	405	12.70%
Lyttelton	J. Joyce	Liberal Prohibitionist Religious Teaching	1895	67.90%
Lyttelton	E. Blake	Liberal	854	30.60%
Lyttelton	J.M. Douglass	Unknown	40	1.40%
Riccarton	G.W. Russell	Liberal, Religious Teaching (Catholic)	1517	51.80%
Riccarton	W. Boag	Opposition, favoured by Catholics although supported existing system	1411	48.20%

Unfortunately, it is extremely difficult to separate men's and women's votes. Polling booth results were published in the *Press*, and are shown in Table 2.4. Accounts of the election day suggest that men and women voted at all booths, although perhaps women's attendance was

[114] 'The General Election, 1893', *AJHR*, 1894, H-19.

concentrated in the morning. There are, however, some comments that can be made about the election.

The first is that the winning candidates in the City of Christchurch all had active ladies' committees, as did Tanner and Russell who won in Avon and Riccarton. However, these candidates also had good support networks overall, and it is not clear that women supported them particularly. Candidates' appeals to 'the ladies' in particular seemed to have been unsuccessful, especially when combined with questionable integrity. Eden George appealed directly to women but despite such appeals, and women active in his support, George had raised the ire of 'political Amazons'. He came last in the poll, just beaten by J. S. Evison, the other candidate to have his morality questioned during the campaign. Now that women were voters, successful candidates needed to appeal to both men and women. It is notable that both George and Evison did badly overall however, and it seems likely that their poor performance was due to the failure of both men and women to vote for them.

The complexity of a three vote ballot makes it hard to assess the total prohibition vote. Nearly 6000 women cast a vote but clearly all of these women did not vote for the leading prohibitionist G. J. Smith, who received just 4510 votes. Reeves and Collins did not suffer for their anti-prohibition views which suggests that a large number of voters either supported continuance or felt more strongly about issues other than prohibition. The number of votes for Sandford, a sitting member, probably suffered from Sandford's reluctance to commit himself on prohibition. He refused the nomination of the prohibitionists, but neither was he nominated by liquor interests, as rumours suggested.[115] However, there is no evidence that women in particular punished Sandford for this stance. It seems most likely women voted on both sides of the prohibition question.

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[115] See letter from Sandford, *Lyttelton Times*, 4 December 1893, p.6 and other letters in subsequent editions. Downey, 'The 1893 General Election', p.148.

Table 2.4 Christchurch City Electorate Candidate Votes by Polling Booth[116]

	Reeves	Smith	Collins	Sandford	Hoare	Bradbury	Hoban	Taylor	Davie	Evison	George	TOTAL
St Albans	226	282	146	164	221	190	43	63	168	125	84	**1712**
Knightstown	351	185	254	289	57	126	140	91	124	59	95	**1771**
Richmond	316	206	211	224	112	112	95	58	75	60	92	**1561**
Montreal St North	339	436	252	250	308	312	61	70	195	142	82	**2447**
Provincial Council	912	672	695	596	398	333	267	276	586	463	311	**5509**
Latimer Square	609	611	438	427	414	384	153	159	335	234	157	**3921**
Tuam St Hall	1131	754	911	710	473	460	374	335	230	216	226	**5820**
Hibernian Hall	239	93	216	90	59	52	480	65	43	276	305	**1918**
Addington	387	382	206	279	260	263	91	206	56	60	102	**2292**
Sydenham	668	716	357	428	515	512	198	560	62	76	133	**4225**
Waltham	253	240	187	139	199	192	156	156	37	54	60	**1673**
TOTAL	**5431**	**4577**	**3873**	**3596**	**3016**	**2936**	**2058**	**2039**	**1911**	**1765**	**1647**	**32849**

[116] *Lyttelton Times*, 29 November 1893, p.5.

It is even more difficult to separate out the religious education vote, since it was split by denomination as well as gender. Notably the winning candidates all supported secular education which suggests that most people did not want religious teaching in any schools. The Hibernian Hall was apparently the stronghold of the Catholic vote, and as shown in Table 2.4, the three Catholic candidates, Hoban, Evison and George did well here. However, so did Reeves, and in any case the Catholic population was small, and unable to swing the election result on its own. The Catholic candidates did poorly overall.[117] Hoare and Bradbury, both supporters of religious education in state schools, performed relatively well by contrast. Further analysis of party and prohibition voting can be found in Chapter Five. Unfortunately, the existence of the three vote ballot in Christchurch excludes it from the analyses performed there.

This analysis of the Christchurch campaign suggests a mixed picture. Gender difference threaded through the campaign in complex ways, confirming the hypothesis that political preferences were not divided on gender lines. There was no women's platform or men's platform, but a number of gendered platforms. These platforms were diverse and sometimes contradictory. One mother defended secular education, only to be denounced for bringing discredit for womanhood. There were Liberal women and conservative women. Women and men both supported and opposed prohibition. Yet, the legacy of the suffragists' construction of a women's politics can be seen in the fact that gender was used to underline political platforms, and in women's readiness and preference for separate organisation. Suffragists' profile in the campaign was not high. Kate Sheppard's gentle reminder that women were conservatives and Liberals, as well as women, cited at the beginning of the previous chapter, reflected the shape of women's organisational responses to the general election, as well as their opinions.

A number of factors consolidated differences between men and women. Men and women largely organised separately, and sat separately at meetings. At mixed meetings there were fewer women than men. The novelty of women's participation set them apart from experienced male voters in the newspaper accounts of the campaign. Gender also threaded through discussions of policy and election issues, with women likely to be associated with the issues of religious education and prohibition, but the division was not clear cut. Women, and men, were much more likely to be united with others of the same gender in partisan organisations, than by policy preference. Some aspects of these differences confirm the hypothesis of women's marginality, but some do not. Women clearly preferred to organise

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[117] Downey, 'The 1893 General Election', pp.205-231.

separately, and separate organisation facilitated registration and canvassing by women. It was at a 'ladies' meeting, that some women heckled Eden George. Moreover, the newspapers and the candidates may have discouraged women from speaking at meetings or canvassing, but they explicitly encouraged them to register and vote.

There were also a number of parallels between men's and women's roles in the campaign. Both men and women attended meetings, wrote letters, canvassed and heckled politicians. The 1893 campaign shows both change, with women participating in electoral politics for the first time, and continuity, with differences between men and women continuing to be relevant in the sphere of electoral politics. It is worth reiterating a point made by two British historians, Pat Thane and Martin Pugh. Both authors caution against expecting too much from a first election, noting that it generally takes a number of years for new groups of voters to become integrated into the political system. [118] Data reviewed in the next chapter suggests that the legacy of the pre-suffrage era was felt for some years to come.

[118] Martin Pugh, 'The Impact of Women's Enfranchisement in Britain,' in *Suffrage and Beyond: International Feminist Perspectives*, ed. Caroline Daley and Melanie Nolan (Auckland: Auckland University Press, 1994); Pat Thane, 'What Difference Did the Vote Make?,' in *Women, Privilege, and Power: British Politics 1750 to the Present*, ed. Amanda Vickery (Stanford: Stanford University Press, 2001).

Figure 2.1 FRANCHISE FOR WOMEN. – Some of the first women voters entering the Tuam Street Hall in November, 1893

The photograph shows women entering the Tuam Street Hall surrounded by male onlookers. The few women are identifiable by their white dresses. This photograph may have been taken later in the day. The *Press* account of the election day suggested that early on election day, it was women who filled the sidewalks outside the polling booths so that the avenues resembled 'a gay garden party'.[119]

It is not entirely clear that this image does show the 1893 election. This photograph was published by the *Press* in its Canterbury Centennial Supplement in 1950.[120] The original provenance of the image is unknown, and there is nothing to verify that it does in fact show the 1893 election. It seems unlikely it was an original *Press* photograph since the paper published very few photographs in 1893. Those that were published appeared in the *Weekly Press* where this image did not appear in 1893.

It is clear that some photographs were taken in Christchurch on election day in 1893. One election candidate, Eden George, was involved in the photographic business, although he had

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[119] *Press*, 29 November 1893, p.5.

[120] *Christchurch Press*, 16 December 1950, Canterbury Centennial Supplement, p.6. The image can be viewed at http://80-library.christchurch.org.nz.ezproxy.canterbury.ac.nz/heritage/photos/disc11 /img0095.asp.

sold his firm, the Eden George Photographic Company, to Wrigglesworth and Binns just before the election. The *Lyttelton Times* noted that George was accompanied by a 'knight of the camera' on election day,[121] but no images seem to have survived.

There is only a small collection of known photographs of election day in 1893. This collection includes images of polling booths and voters in New Plymouth and Tahakopa, South Otago.[122] There are no other known extant photographs taken in Christchurch at the 1893 election.

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[121] *Lyttelton Times*, 29 November 1893, p.5.

[122] Coney, *Standing in the Sunshine: A History of New Zealand Women since They Won the Vote*, pp.32-33; Dorothy Page, 'Introduction,' in *The Suffragists, Women Who Worked for the Vote: Essays from the Dictionary of New Zealand Biography* (Wellington: Bridget Williams Books, 1993), pp.14-15.

Chapter 3
Gender Counts: Official Data, and Voter Turnout

In newspaper accounts of the 1893 election in Christchurch, the novelty of women's attendance at the polls was constantly remarked upon. The same interest is evident in the presentation of official election results found in the *Appendices to the Journals of the House of Representatives* (*AJHR*) and the *New Zealand Official Yearbook* (*NZOYB*). Just as women's participation in the election campaign had been remarked upon, so was their voting rate specially enumerated in the official election results for 1893. The *New Zealand Official Yearbook* of 1894 referred to the 'great step' of admitting women to the franchise, commenting:

> A feature of the election was the orderliness and sobriety of the people. Female voters were in no way molested. Canvassing was carried on by female electors with considerable energy in many places.[1]

The *AJHR* report on the 1893 election listed women's registration and turnout, but not men's, although men's could be calculated from the totals.[2] 'Male' and 'female', 'men' and 'women' were categories utilized by election officials, while other categories of interest such as occupation or age were not utilized by officials.

It would be a mistake to assume that official statistics provide a neutral perspective on the elections. As Joan Scott suggested of French labour statistics, official data may work to establish 'the authority of certain visions of the social order.' Scott has argued that it is vital to problematise and contextualise the categories utilized in official reports, and to explore the debates and discussion implicit in the categorizations. Failing to explore this side of statistical data underutilises the information in quantitative sources.[3]

It seems likely that, initially at least, men's and women's turnouts were separately listed because of great interest in the effects of women's suffrage. The election of 1893 was the first election at which New Zealand women could vote, and there was great international interest

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[1] E. J. Von Dadelszen, 'Representation and the General Election of 1893,' in *NZOYB* (1894), pp.256.

[2] 'The General Election, 1893', *AJHR* (1894), H-19.

[3] Joan Wallach Scott, 'A Statistical Representation of Work: La Statistique De L'industrie a Paris, 1847-1848,' in *Gender and the Politics of History* (New York: Columbia University Press, 1988), p.115.

since women could vote in few other places.[4] However, the gendered listings also reflected contemporary understandings of sexual difference in the political sphere that have been tracked in the previous chapters. Gender differences had been enshrined in legislation that excluded women from voting until 1893, and indeed, from standing as a candidate for parliament until 1919. The debate over women's suffrage had sustained these gender differences, and comment on women's participation in the 1893 election campaign reinforced them. The fundamental agreement on gender difference was reflected in the lack of debate over the listings. I found no contemporary discussion as to why gender counts should be made, or why they were no longer made after 1954. Gender turnout figures were not published after the 1956 Electoral Act, when a number of changes to the compilation of electoral results were made. Obviously a decision was made at this time to stop publishing the gender breakdown of turnout, though it is not clear at what level it was taken.[5]

There were some practical and historical reasons for the separate listings. Turnout of voters had been customarily recorded prior to women's entry into the vote force in 1893, so we would expect to see it listed after 1893. The reason for listing only women's turnout in 1893 may have been the lack of accurate figures for men's registration resulting from problems with the men's roll. The number of men's names on the electoral rolls was far in excess of the eligible population as result of changes in electoral law that had removed the right to register in more than one electorate. The rolls were not purged in 1893, leaving on the roll duplicate registrations as well as the names of those men who had died or left the electorate.[6] This consideration was largely irrelevant by 1899 by which time men's registration had been mostly cleaned up, but men's and women's registration and turnout continued to be separately listed.

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[4] Raewyn Dalziel, 'Presenting the Enfranchisement of New Zealand Women Abroad,' in *Suffrage and Beyond: International Feminist Perspectives*, ed. Caroline Daley and Melanie Nolan (Auckland: Auckland University Press, 1994).

[5] I found nothing in the parliamentary debates or in the extant archival material. The location of archival material relating to elections is complicated by changing administrative responsibilities. In 1893, the Electoral Department was part of the Colonial Secretary's Office. After 1905 it moved between the Department of Internal Affairs and the Department of Justice. When changes were made to electoral law in 1956, the Electoral Department was a branch of the Justice Department. Archives New Zealand's Wellington Office does hold a record group 'EL' for electoral. This contains records originating from both the Departments of Internal Affairs and Justice relating to elections.

[6] Neill Atkinson, *Adventures in Democracy: A History of the Vote in New Zealand* (Dunedin: Otago University Press, 2003), pp.166-168.

The information contained in the electoral rolls was also shaped by gender. The rolls listed the names of all individuals who had registered to vote and their occupation. Right from the beginning there was some confusion over how women should list their occupations. Prior to the 1893 election, the *Lyttelton Times* advised its readers that 'housewife' was preferable to 'wife', and that 'if the applicant is of no occupation the word 'spinster' is correct and 'occupation' should be struck out and 'condition' written in.'[7] Presumably no married women could be without occupation. Indeed, the *Christchurch Press* commented that a woman 'who does no domestic duties whatever, must be a most undesirable person, and a very funny sort of a lady.'[8] Men's occupations must have been too obvious to require comment.

A review of a sample of pages from the 1893 Christchurch electoral roll suggests that between 60 and 70% of women listed their occupation as 'domestic duties', 'housewife' or some variation thereof. None put 'wife' or 'married' for occupation.[9] By 1902, 60% of women in Caversham were listed as 'married' on the electoral roll, with a further 19.4% listed as engaged in 'domestic duties.' Olssen attributed the shift to officials trying to clean up the rolls,[10] but after 1902 differences in the recording of men's and women's occupations were made official. The 1905 Electoral Act required women to give their marital status for their occupation.

The Act included in its schedule a 'Claim For Enrolment' form. Female electors were instructed to insert 'Spinster,' 'Married,' or 'Widow'' in answer to the question 'What is your occupation?'[11] Those women who did insert any other occupation were sent another form that asked for their marital status. This form stated:

> As the Legislature Act requires the addition of spinster, married or widow, instead of occupation in the case of female electors, will you kindly reply at foot hereof which of these three descriptions you come under...[12]

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[7] *Lyttelton Times*, 23 September 1893, p.6.

[8] *Christchurch Press*, 4 November 1893, p.7.

[9] I checked pages 6-7, 22-23 and 36-37 of the roll. Of a total of 114 women, 72 had 'home duties' or equivalent for occupation. *1893 Electoral District of the City of Christchurch General Roll of Persons entitled to vote for Members of the House of Representatives of New Zealand*, 5 October 1893.

[10] Erik Olssen, *Building the New World: Work, Politics and Society in Caversham, 1880s-1920s* (Auckland: Auckland University Press, 1995), p.72.

[11] First Schedule, 'The Electoral Act, 1905', *The Statutes of New Zealand* (1905), p.188.

[12] 'Notice to female elector in regard to description', Electoral Form No.56, EL12 12/7/13, Archives New Zealand, Wellington. The form was undated, but notes on the file make it clear that it was in use prior to 1925.

Furthermore, the Act required Marriage Registrars to send lists of marriages 'of all adult women' to the Registrars of the appropriate electoral districts, so that married women's new names, addresses and occupations could be inserted in the appropriate place in the electoral roll.[13] After the legislative change, the 1905 roll for the Caversham electorate gave marital status for over 96% of women.[14]

In the absence of other evidence, it seems likely that the shift to classify women by their marital status in the electoral rolls merely brought the rolls into line with the census classifications where similar changes in the recording of female occupation in the census had taken place much earlier. The involvement of E. J. von Dadelszen, Registrar General from 1892, in both census and electoral statistics makes this more likely. [15] Changes in census categorisations contributed to the construction of the dependent woman, inherent in the increasingly persuasive concept of the male breadwinner, by placing women occupied in unpaid domestic labour in the 'dependent class.' Australasian statisticians met in 1890 to discuss changes in the census' classification of occupations. The existing classification system divided the population into commercial and industrial, but included a large number of 'indefinites' and did not distinguish employers from the employed. The new classification aimed to better describe the paid workforce, which was mostly male, and reduced the indefinites and the existing 'domestic' class. Housewives were shifted from the 'domestic' to the dependent class, which included

> All persons dependent upon relatives or natural guardians, including wives, children, and relatives not engaged in pursuits for which remuneration is usually paid, and all persons supported by private or public charity, or dependent upon the public revenue.[16]

Housewives now fell in the same class as children, invalids and prisoners. The occupations of any 'female breadwinners' were listed in census tables, but most women fell in the dependent class. The classification system did reflect the fact that many women were engaged in unpaid

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[13] 'The Electoral Act, 1905', p.133.

[14] Olssen, *Building the New World*, p.72.

[15] Ian Pool, 'Edward John Von Dadelszen,' in *Dictionary of New Zealand Biography Volume Two 1870-1900* (Wellington: Bridget Williams Books and Department of Internal Affairs, 1993). Desley Deacon has noted the important role officials played in the construction of Australian statistics. Desley Deacon, *Managing Gender: The State, the New Middle Class and Women Workers 1830-1930* (Melbourne: Oxford University Press, 1989).

[16] E. J. von Dadelszen, *Report on the Results of a Census of the Colony of New Zealand Taken for the Night of the 12th April, 1896* (1897), p.60.

domestic work, but it shaped the meanings given to that pattern. [17] In Joan Scott's words, 'sexual difference is itself articulated as a principle and practice of social organization.'[18]

The new classifications was shaped by ideas about class as well as gender (although classification of men's occupations was actually organised on industrial lines). Deacon and Olssen have both noted the influence of what Deacon calls 'collectivist' social philosophies on the compilation of official statistics on occupation. Such philosophies separated women's work in the home from categories of work, skill and production, contributing to the construction of male breadwinner and his family. These philosophies also emphasised the brotherhood of man, mutualism and the efficacy of working men's organisations, and in Caversham at least, both class and gender were central elements in political organisation as working men mobilised to protect their control of the job.[19]

There does not seem to have been widespread resistance to the census classifications, or the use of marital status on the electoral rolls. Complaints were most likely verbally expressed to census officials and electoral registrars, and may remain lost to historians. However, there was at least one objection to the census classifications. Kate Sheppard took:

> exception to [wives] being classified as "dependents". A woman who gives up the opportunity of wage-earning to become a wife, who keeps her house and brings up a

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[17] Katrina Alford, 'Colonial Women's Employment as Seen by Nineteenth-Century Statisticians and Twentieth-Century Economic Historians,' *Labour History* 51 (1986); Dadelszen, *Report on the Results of a Census 1896;* Desley Deacon, 'Political Arithmetic: The Nineteenth-Century Australian Census and the Construction of the Dependent Woman,' *Signs* 11, no. 1 (1985); Olssen, *Building the New World*, especially pp.71-73. Copies of reports from the 1890 conference of Australasian statisticians (then described as 'statists') are held by the University of Canterbury Library as part of the Official Publications Collection (HA12.c748), but their original provenance in unclear. Conference of Statists, *Census of Australasia, 1891 [Report of] Conference of Statists Held at the Parliamentary Buildings, Hobart, March 3rd to 18th 1890* (Hobart, Tasmania: 1890); R.M. Johnston, *Covering Letter Accompanying Report of the Conference of Statists Held at the Parliamentary Buildings, Hobart, March 3rd to 18th, 1890. Also a Suggested Mode for Systematically Tabulating Occupation Sub-Groups, by the Government Statistician of Tasmania* (Hobart: 1890).

[18] Joan Wallach Scott, 'Some Reflections on Gender and Politics,' in *Revisioning Gender*, ed. Myra Max Feree, Judith Lorber, and Beth B. Hess (Thousand Oaks, California: Sage Publications, 1999), p.79.

[19] Deacon, 'Political Arithmetic.'; Olssen, *Building the New World*, p.156-157.

> family, should not be called a 'dependent,' for she earns her living, in many cases far more hardly than her husband does, though he is the actual wage receiver.[20]

Kate Sheppard listed her occupation on the 1893 electoral roll as 'household duties.'[21]

The electoral rolls went a step further than the census by categorising all women by their marital status, making their women's work invisible in the world of electoral politics, and suggesting that women's electoral behaviour was tied not to their occupation, be it paid or unpaid, but to their menfolk, through their marital status. The separation of men's and women's electoral registration and turnout in the reports of the *AJHR* and the *NZOYB* presents a slightly different picture, grouping women not by family status, but as women. In both the electoral rolls and other sources of election data, gender was a category of interest. The retention of the recording of men's and women's turnout suggests that gender was considered politically relevant, and allows an investigation of whether gender difference was embodied in the registration and turnout of men and women in 1893 and subsequent elections

Registration in 1893

Registration of voters was a particular issue in 1893 because no women were on the rolls prior to their enfranchisement. New rolls had to be created for a large section of the popualtion who had not hitherto registered or voted. In later elections, the numbers of registered voters came close to the number in the eligible population. In 1896 close to 90% of eligible women, registered to vote, although this was still below men's registration rate of 99%. By 1899, 95% of women had registered, and 98% of men.[22] The registration of women was enthusiastically undertaken in Christchurch in 1893, and the reports in Christchurch newspapers suggest that the process was similar in other centres. Officials and political organisations worked at women's registration, and women around the country registered their names. Most men had already registered for the previous election.[23]

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[20] Kate Sheppard, 'Economics,' *Canterbury Times*, 15 December 1892; reprint, *The Woman Question: Writings by the Women Who Won the Vote*, ed. Margaret Lovell-Smith (Auckland: New Women's Press, 1992), pp.106-109, p.108.

[21] *1893 Electoral District of Riccarton General Roll of Persons entitled to vote for Members of the House of Representatives of New Zealand*, 5 October 1893.

[22] These figures are those given in the *NZOYB* of 1903 which used estimated total adults to assess registration rates. 'Representation and the General Election of 1902,' *NZOYB* (1903), p.224.

[23] See for example *Lyttelton Times*, 22 September 1893, p.5. Sandra Coney, *Standing in the Sunshine: A History of New Zealand Women since They Won the Vote* (Auckland: Penguin Books (NZ) Ltd, 1993), p.32; Patricia Grimshaw, *Women's Suffrage in New Zealand* (Auckland: Auckland University Press, 1987), p.96.

Table 3.1 Registration in 1893[24]

Electorate	Number Registered Women	Number Adult Women, 1896	Percentage Adult Women Registered	Number Registered Men	Number Adult Men, 1896	Percentage Adult Men Registered
New Zealand Total (N=59, excluding no contest electorates)	106004	152715	69.4%	186454	183914	101.4%
New Zealand Total (N=62, including no contest electorates)	109461	157942	69.3%	193536	191881	100.9%
New Zealand Total (N=62, including no contest electorates)	109461	139471 (estimated 1893 population)	78.5%	193536	179539 (estimated 1893 population)	107.8%
City of Christchurch	6710	9167	73.2%	7902	8037	98.3%
Riccarton	1634	2209	74.0%	2249	2550	88.2%
Avon	1732	2659	65.1%	2589	2545	101.7%
Lyttelton	1581	2400	65.9%	2008	2324	86.4%
City of Auckland	6660	9295	71.7%	10128	8618	117.5%
City of Wellington	7644	9837	77.7%	9217	9949	92.6%
City of Dunedin	7280	9625	75.6%	9292	8061	115.3%
Caversham	1552	2161	71.8%	1947	1958	99.4%

Assessing comparative registration counts between electorates in 1893 is made difficult by the lack of accurate counts of the population of eligible voters in each electorate. New Zealand population counts were made at each census year. At the 1891 census, only the eligible male population was counted at electorate level. The next census was held in 1896 and the number of adult men and women in each electorate was given with the census report.[25] However, in 51 of the 62 electorates, population had grown between 1891 and 1896 and so comparing registration in 1893 with the 1896 population levels underestimates the true registration proportion in most electorates. Estimates of the total New Zealand population in 1893 were published with the election results, but there are no electorate specific estimates.[26]

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[24] Data in this table is taken from 'The General Election, 1893', *AJHR* (1894) H-19; Dadelszen, 'Representation and the General Election of 1893,' *NZOYB* (1894); 'Representation and the General Election of 1896,' *NZOYB* (1897); 'Proposed Alterations in Boundaries of Electoral Districts', Supplement to the *New Zealand Gazette* of Thursday October 8, 1891 (14 October 1891) p.1139; 'Census of New Zealand April 1891', *AJHR*, (1891 Session II) H-17, p.2; *Results of a Census of the Colony of New Zealand taken for the night of the 12th April, 1896. Part I Population and Dwellings*, (1896) p.164.

[25] *Results of a Census... 1896, Part I,* p.164.

[26] Dadelszen, 'Representation and the General Election of 1893,' *NZOYB* (1894) p.255; 'Representation and the General Election of 1896,' in *NZOYB* (1897), pp.358-359. Note that the estimates differ between these two reports. I use the 1897 report.

Table 3.1 shows the counts for New Zealand as a whole, for the Christchurch electorates, for the three other city electorates, and the electorate of Caversham.

The figures for men's registration reveal a second problem, prefigured in the previous chapter. The number of men on the rolls exceeded the male population in some areas, hence the percentages that exceed 100 in Table 3.1. This was a legacy of old electoral law which had allowed voters to register in more than one electorate. This right had been removed prior to the 1893 election, but the rolls had not been cleansed of duplicate names.[27] Inaccurate figures for men's registration frustrate further analysis. In particular, it is not possible to compare women's registration with men's, or even with men's registration at previous elections, since the rules surrounding registration had changed. We can merely note that a substantial majority of women registered.[28]

Estimates of women's registration using the 1896 population counts shown in Table 3.1 suggest that women's overall registration rate was around 70% of the eligible population. The registration rate based on the estimate of the total 1893 population is much higher at 78%. It follows that the electorate percentages based on the 1896 population generally underestimate women's registration rate. Indeed, detailed research on the Caversham electorate suggests that the true percentage of women that registered there was 80%,[29] whereas using the 1896 population suggests a lower registration rate of 72%. Note however, that Caversham was one of the few electorates where population shrank between 1890 and 1896.[30] It seems likely that electorates where the population shrank or remained static would have a higher registration rate than electorates where there were a number of newcomers. Not only might newcomers be less likely to register, but electoral law required a three month residency period. The data

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[27] Atkinson, *Adventures in Democracy*, p.94.

[28] Unfortunately, the change from plural registration to single electorate registration also makes it difficult to use voter transition models to estimate men's and women's voting preferences in 1893. For an example of the use of voter transition models see Sara Alpern and Dale Baum, 'Female Ballots: The Impact of the Nineteenth Amendment,' *Journal of Interdisciplinary History* 16, no. 1 (1985).

[29] Kirsten Thomlinson, 'We the Undersigned: An Analysis of Signatories to the 1893 Women's Suffrage Petition from Southern Dunedin' (MA Thesis, University of Otago, 2001), p.133.

[30] The Representation Commission report listed the 1890 population at 7658 town dwellers and 2102 rural dwellers using information from the 1890 census. This gave a total population of 9760. The 1896 Census listed the Caversham population at 8343, 3994 men, and 4349 women. 'Proposed Alterations in Boundaries of Electoral Districts', p.1139; 'Census of New Zealand April 1891', *AJHR* (1891 Session II) H-17, p.2.

certainly reflect the fact that expanding electorates had lower registration rates, although of course the tendency is exaggerated by using 1896 population counts.

Figure 3.1 shows women's registration in 1893 for each electorate, based on the 1896 population, against the average annual population shift, a proxy for the stability of the electorate, calculated by taking the difference between electorate populations at the 1896 and 1891 censuses, divided by the number of years between the two censuses. Those electorates on the left of the graph had shrinking population, while those on the right of the graph had an expanding population. Those electorates with the highest population increase had low registration rates for women.

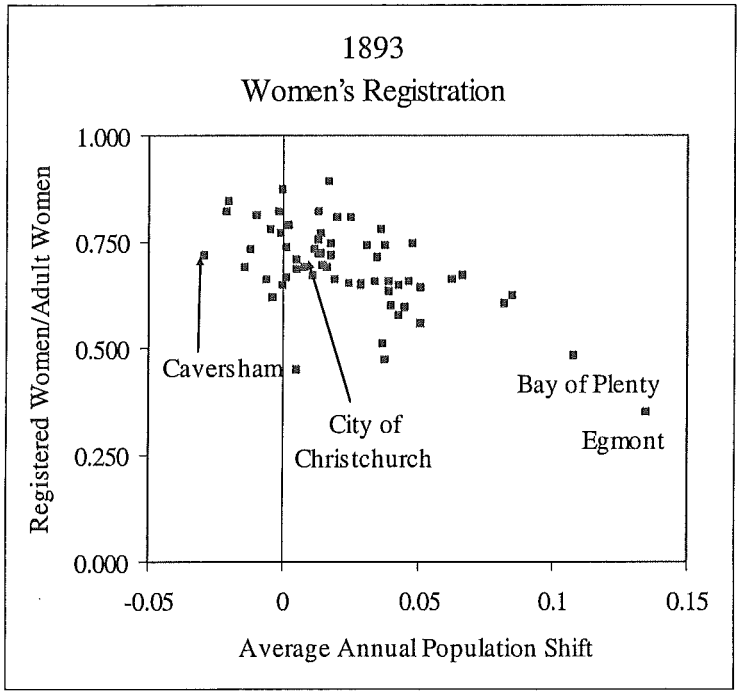

Figure 3.1 Women's Registration and Average Annual Population Shift, 1893[31]

Turnout in 1893

A large proportion of registered women did vote in 1893. In the City of Christchurch 5989 women went to the polling booths, 89% of those registered. This was 65% of the eligible (1896) population and was above the national figure, where 59% of eligible women voted. Of the eligible men's (1896) population, 79% cast a vote.

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[31] Average Annual Population shift $= \frac{1896\,Population - 1890\,Population}{1890\,Population * 5}$, where 5 is the number of years between the censuses of 1891 and 1896. Number Adult Women as at 1896.

Table 3.2 Population, Registration and Turnout in 1893[32]

Electorate	Number of Votes Cast by Women	Number of Adult Women (1896 Census)	Percent Eligible Women who voted	Number Regis-tered Women	Percent Registered Women who voted	Number of Votes Cast by Men	Number of Adult Men (1896 Census)	Percent Eligible Men who voted
NEW ZEALAND TOTAL (Excluding no contest and Maori electorates)	90290	152,520 139,471 Estimated 1893 population but includes no contest electorates	59.2% 64.5%	106004	85.2%	129792	183,938 179,539 Estimated 1893 population but includes no contest electorates	70.6% 72.3%
City of Christchurch	5989	9167	65.3%	6710	89.3%	6313	8037	78.5%
Riccarton	1417	2209	64.1%	1634	86.7%	1511	2550	59.3%
Avon	1443	2659	54.3%	1732	83.3%	1747	2545	68.6%
Lyttelton	1324	2400	55.2%	1581	83.7%	1465	2324	63.0%
City of Auckland	5283	9295	56.8%	6660	79.3%	6045	8618	70.1%
City of Wellington	6146	9837	62.5%	7280	84.4%	7328	9949	73.7%
City of Dunedin	6306	9625	65.5%	7644	82.5%	6571	8061	81.5%
Caversham	1277	2161	59.1%	1552	82.3%	1305	1958	66.6%

Figures for men's and women's total turnout, and their turnout in selected electorates in 1893 are shown Table 3.2. As before, precision is compromised by the available information. Percentages based on the 1896 population mostly underestimate the true turnout, since population had grown in most electorates. Accordingly, percentages based on estimates of the total 1893 population suggest higher levels of both men's and women's turnout than figures based on the 1896 counts. Unfortunately, the estimates for the total 1893 population include three 'no contest' electorates where no vote was held, so percentages based on these figures are underestimates. Overall turnout was likely to have been slightly higher than 65% and 72% for women and men respectively. Note also that the difference between men's and women's voting rates decreases when the 1893 population estimates are used. This is consistent with the fact that the proportion of women to men was increasing.[33]

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[32] Figures are from 'The General Election, 1893,' in *AJHR* (1894); 'Report of the Representation Commission,' in *AJHR* (1894), p.255, and *Results of a Census...1896. Part I*, p.164.

[33] Charlotte Macdonald, 'Too Many Men and Too Few Women: Gender's 'Fatal Impact' in Nineteenth-Century Colonies,' in *The Gendered Kiwi*, ed. Caroline Daley and Deborah Montgomerie (Auckland: Auckland University Press, 1999).

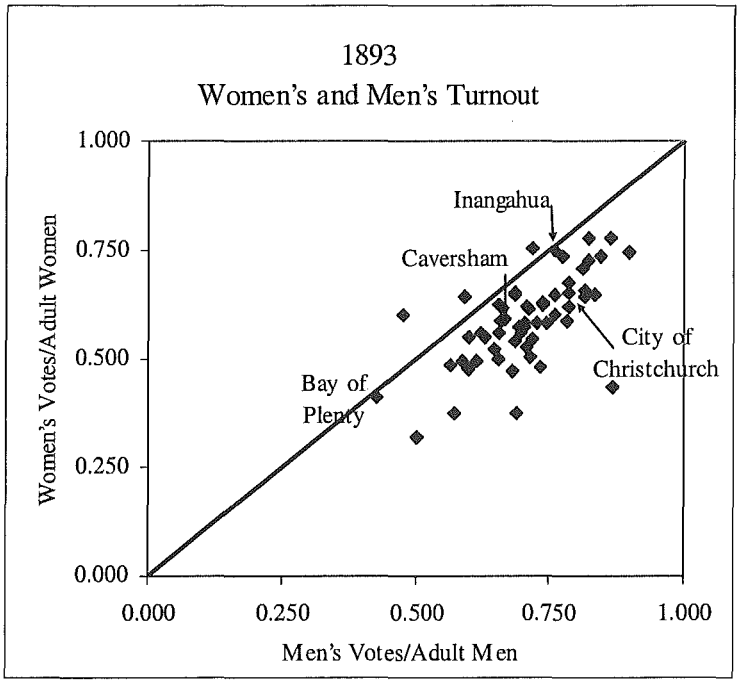

Figure 3.2 Women's and Men's Turnout in 1893

Men's and women's turnout in all electorates, based on the 1896 population counts, are shown in Figure 3.2. The graph makes it clear that, in almost all electorates, men's turnout exceeded women's. If the rates were equal they would fall on the diagonal line, $y = x$, shown on the graph. Most points fall below the line, indicating men's turnout exceeded women's.

Table 3.3 lists the rates for all electorates and gives two measures for assessing the significance of the difference between men's and women's voting rates. These are the chi-square statistic and the Fisher exact test probabilities. Further details on these tests are given in Appendix One. The chi-square statistic here measures whether men's and women's voting rates were significantly different. The null hypothesis is that turnout was independent of gender and that there was no significant difference between men's and women's turnouts. The alternative hypothesis is that voting rates were dependent on gender, or that men's and women's turnouts were significantly different. A significant result, that is a chi-square statistic with p-value less than 0.05, suggests that the null hypothesis can be rejected, and that men's and women's voting rates were not the same. In only two electorates, Bay of Plenty and Inangahua, was the chi square statistic not significant. In these electorates, there was not enough evidence to reject the null hypothesis, and as Table 3.3 shows, men's and women's turnouts were very similar in those electorates. Both men and women has low turnout in Bay of Plenty, an electorate with a high level of population increase during the period. The men's turnout out there was lowest of any electorate. Inangahua had only a low percentage of

women in its adult population. Perhaps women were more likely to reside in townships near polling booths. Further research might illuminate why these two electorates were different.

Table 3.3 Women's and Men's Turnout in 1893

Electorate	Women's Turnout	Men's Turnout	Chi Square	Significance	Fisher Exact Left Sided Probability
All Electorates			4802.225	<0.0001	
Ashburton	0.709	0.813	67.4029	<0.0001	0.0000
Ashley	0.586	0.659	24.3983	<0.0001	0.0000
Avon	0.543	0.686	113.2823	<0.0001	0.0000
Awarua	No contest				
Bay of Islands	0.497	0.588	38.6063	<0.0001	0.0002
Bay of Plenty	0.413	0.425	0.9153	0.3387	0.1759
Bruce	No contest				
Buller	0.736	0.848	81.1879	<0.0001	0.0000
Caversham	0.591	0.666	25.0776	<0.0001	0.0000
Chalmers	0.642	0.817	179.2698	<0.0001	0.0000
City of Auckland	0.568	0.701	340.6178	<0.0001	0.0000
City of Christchurch	0.653	0.785	367.1724	<0.0001	0.0000
City of Dunedin	0.655	0.815	567.2031	<0.0001	0.0000
City of Nelson	0.584	0.727	280.9874	<0.0001	0.0000
City of Wellington	0.625	0.737	284.4502	<0.0001	0.0000
Clutha	0.559	0.656	47.9575	<0.0001	0.0000
Eden	0.582	0.705	91.0741	<0.0001	0.0000
Egmont	0.318	0.503	209.4626	<0.0001	0.0000
Ellesmere	0.581	0.746	130.677	<0.0001	0.0000
Franklin	0.725	0.825	60.9984	<0.0001	0.0000
Grey	0.736	0.775	8.8812	0.0029	0.0017
Hawke's Bay	0.435	0.868	1104.0537	<0.0001	0.0000
Inangahua	0.752	0.76	0.2747	0.6002	0.3137
Invercargill	0.62	0.786	170.6421	<0.0001	0.0000
Kaiapoi	0.649	0.835	188.395	<0.0001	0.0000
Lyttelton	0.552	0.63	30.2489	<0.0001	0.0000
Manukau	0.549	0.598	11.9149	0.0006	0.0000
Marsden	0.504	0.716	216.3907	<0.0001	0.0000
Masterton	0.5	0.657	151.4747	<0.0001	0.0000
Mataura	0.483	0.734	320.6336	<0.0001	0.0000
Napier	0.621	0.707	45.873	<0.0001	0.0000
New Plymouth	0.525	0.649	85.9441	<0.0001	0.0000
Oamaru	0.676	0.787	67.1224	<0.0001	0.0000
Otaki	0.374	0.573	192.1817	<0.0001	0.0000
Palmerston	0.56	0.695	113.7895	<0.0001	0.0000
Pareora	0.655	0.787	88.7011	<0.0001	0.0000
Parnell	0.572	0.694	81.5446	<0.0001	0.0000

Electorate	Women's Turnout	Men's Turnout	Chi Square	Significance	Fisher Exact Left Sided Probability
Patea	0.476	0.6	73.086	<0.0001	0.0000
Rangitata	0.617	0.71	35.969	<0.0001	0.0000
Rangitikei	0.547	0.717	189.7811	<0.0001	0.0000
Riccarton	0.641	0.593	11.9653	0.0005	0.9998
Selwyn	0.574	0.704	69.9241	<0.0001	0.0000
Taieri	0.648	0.762	60.0203	<0.0001	0.0000
Thames	0.601	0.476	82.8553	<0.0001	1.0000
Timaru	0.779	0.825	14.3248	0.0002	0.0000
Tuapeka	0.653	0.687	5.1977	0.0226	0.0125
Waiapu	0.6	0.762	166.6377	<0.0001	0.0000
Waihemo	0.754	0.721	5.8828	0.0153	0.9932
Waikato	0.526	0.706	122.1732	<0.0001	0.0000
Waikouaiti	0.488	0.564	24.2163	<0.0001	0.0000
Waimea Sounds	0.376	0.687	352.6983	<0.0001	0.0000
Waipa	0.474	0.683	220.5642	<0.0001	0.0000
Waipawa	0.586	0.781	247.3931	<0.0001	0.0000
Wairarapa	0.78	0.864	52.0089	<0.0001	0.0000
Wairau	0.747	0.898	153.8202	<0.0001	0.0000
Waitaki	0.624	0.654	3.9844	0.0459	0.0250
Waitemata	0.629	0.736	58.1105	<0.0001	0.0000
Wakatipu	0.62	0.66	6.7187	0.0095	0.0053
Wallace	0.494	0.614	68.2056	<0.0001	0.0000
Wanganui	0.561	0.622	22.115	<0.0001	0.0000
Wellington Suburbs	0.65	0.687	8.3938	0.0038	0.0021
Westland	No contest				

The second measure is the Fisher Exact Test. Here the probabilities or p-values quoted are from a one sided test. The null hypothesis is that women's turnout was greater than or equal to men's. The alternative hypothesis states that women's turnout was lower than men's. A significant result, which is a probability less than 0.05, indicates that null hypothesis can be rejected and that women's turnout was significantly lower than men's. In almost all electorates, the Fisher probabilities were less than 0.05, indicating that women's turnout was significantly lower than men's in most electorates. Bay of Plenty and Inangahua have p-values greater than 0.05, since men's and women's turnout were very close in those electorates. Three other electorates also have non-significant p-values. In Riccarton, Thames and Waihemo women's turnout exceeded men's. These are the three points above the diagonal line in Figure 3.2.

The exceptions of Riccarton, Thames and Waihemo are not explained by any of the available quantitative measures. Figure 3.3 shows the relationship between population change and

differences between men's and women's turnout. The few points that fall below the horizontal axis are those electorates where women's turnout exceeded men's. In all other electorates, men's turnout exceeded women's. Electorates where the population was decreasing are shown at the left of the graph. Points on the right of the graph represent electorates where the population was increasing. In both types of electorates, men's turnout exceeded women's, with only a few exceptions, and there is no clear pattern.

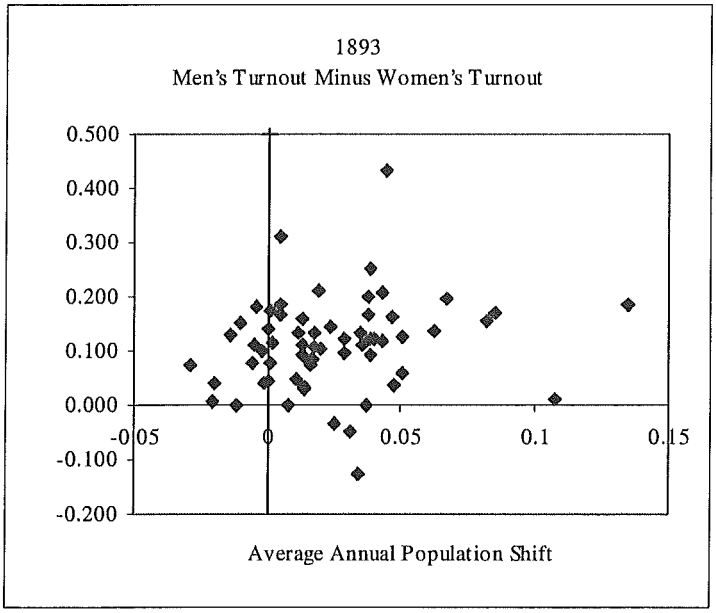

Figure 3.3 Difference between Men's and Women's Turnout and Average Annual Population Shift, 1893

Even across the urban rural split, which Robert Chapman has argued was a crucial element of twentieth century politics, [34] men's voting rates exceeded women's in 1893. Some commentators did claim that country women would be less likely to vote because they opposed women's suffrage and because of the difficulty of getting to polling booths,[35] but the evidence does not support this. While analysis of the difference between the behaviour of

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[34] Robert M. Chapman, 'The Significance of the 1928 General Election: A Study in Certain Trends in New Zealand Politics in the Nineteen-Twenties' (MA Thesis, University of Auckland, 1948); Robert M. Chapman, 'The General Result,' in *New Zealand Politics in Action: The 1960 General Election*, ed. R. M. Chapman, W. K. Jackson, and A. V. Mitchell (London: Oxford University Press, 1962); Robert M. Chapman, 'The Response to Labour and the Question of Parallelism of Opinion, 1928-60,' in *New Zealand Politics and the Social Pattern: Selected Works by Robert Chapman*, ed. Elizabeth McLeay (Wellington: Victoria University Press, 1999).

[35] See for example *Lyttelton Times*, 12 September 1893, p.6; Sir G. S. Whitmore, Legislative Council, 18 August 1893, *New Zealand Parliamentary Debates*, Volume 81, 1893, p.143.

rural and urban voters is hampered by ecological fallacy, it is possible to compare voters' behaviour in all rural electorates with their behaviour in all urban electorates, using data published by the Representation Commission. [36] The turnout of voters in city electorates was not conspicuously different from that of voters in rural electorates. Figure 3.4 shows the difference between men's and women's turnout against the proportion of rural dwellers in the electorate. Points at the left of the graph represent the city electorates. Those on the right side of the graph represent totally rural electorates. There was much variation amongst the rural electorates in 1893, and both the highest and lowest turnout of women were recorded in rural electorates.

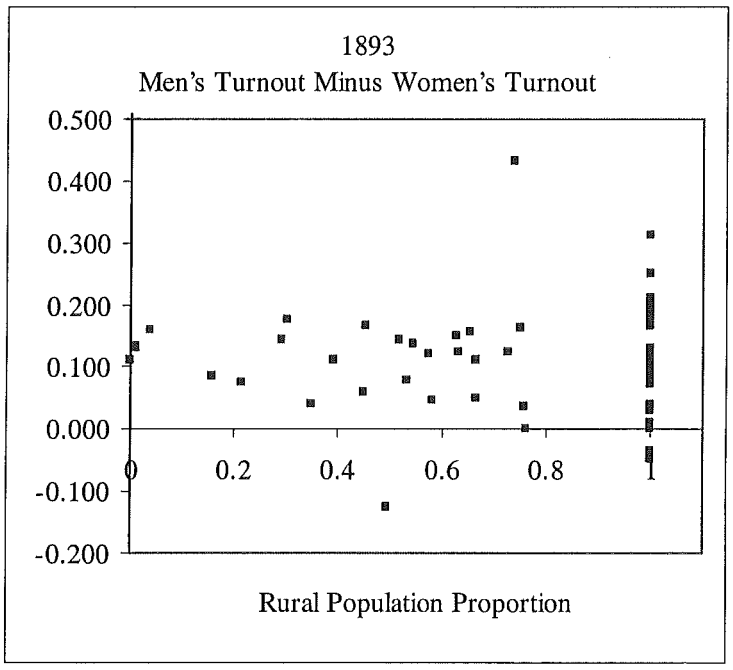

Figure 3.4 Difference Between Men's and Women's Turnout and Rural Population Proportion, 1893

It seems likely that factors specific to the election campaign might have been at play in Riccarton. The involvement of women in candidates committees in Riccarton was noted in the *Lyttelton Times*, which remarked on the 'great interest' taken by women electors, many of whom had joined candidates' committees.[37] Riccarton was also Kate Sheppard's electorate,

[36] The definition of rural and urban areas thus follows the Commission's definitions. 'Rural' population consisted of those living in communities smaller than 2000 people and more than five miles from a central post office located in one of the four urban centres. The remaining population was classified 'urban.' Here the rural population proportion is calculated as $\frac{Ruralpopulation}{Rural + Urbanpopulation}$.

[37] *Lyttelton Times*, 29 November 1893, p.5.

although there is little evidence of her involvement in canvassing, perhaps the women in that electorate felt a particular connection with the suffrage campaign. Further research is necessary regarding the election campaigns of Thames and Waihemo, although a clue to the voting rates there may be found in the importance of goldmining in both these areas.

Turnout in Christchurch was relatively high. Both men's (76%) and women's (65%) turnout fell just inside the upper quartile. Christchurch turnout was similar to turnout in other urban centres. The high level of Christchurch women's turnout suggests that there was a balance between the promotion of women's involvement and resistance to it. Encouragement from women and women's political groups, and media attention to the importance of women actually voting may have offset the barriers that women faced in other aspects of the election process, such as media and candidate censure of their participation in canvassing and their association with 'fads' and side issues.

Turnout in Christchurch was substantially higher than that of Caversham. There, based on the 1896 population, 59% of women and 67% of men cast a vote. As for registration, since the 1896 population was smaller than that of 1890, the Caversham percentage is likely to be slightly higher than the true percentage. The Christchurch figures are likely to be slightly lower than the true percentage because of population growth.

The level of women's turnout in Caversham presents something of a paradox. Women in southern Dunedin, an area which encompassed the Caversham electorate and part of the City of Dunedin electorate, showed exceptional enthusiasm for the last suffrage petition. Fifty seven percent of southern Dunedin women signed the petition, compared with just 22.5% in Christchurch. Under 25% of women throughout New Zealand signed the petition. Why did such enthusiasm not translate into exceptional levels of turnout, and indeed registration?

Support for the suffrage petition was low in places where there was a weak movement for women's franchise, such as Auckland. The movement was strong in Dunedin, but the enthusiasm which Caversham women showed for the petition has been attributed to a combination of factors. Women from skilled working class families showed particular support as did women from non-conformist religions. Established neighbourhoods tended to have denser support. However, support was high overall, which suggests that the particular political culture, stressing the independence of the manly worker, that developed in Caversham, encouraged women to organise and sign the petition, perhaps to assert their own independence from men, but also to insist upon women's role in social change. Moreover, the

arch enemy of the suffragists, Henry Fish, resided in Dunedin, and his crooked tactics may have mobilised women to sign.[38]

Kirsten Thomlinson's close analysis of the election rolls and the 1893 suffrage petition suggests that class was a factor in Caversham women's political mobilisation. Middle class women without paid work were under-represented on both the electoral roll and petition, although they were more likely to register than to sign the petition. However, Thomlinson also notes that Caversham may have had lower numbers of such women than other electorates, and so the reluctance of middle class women to vote does not explain the relatively low turnout and registration of Caversham women compared with other electorates.

It seems likely that factors specific to the election campaign might be at play. At first glance there are similarities between Caversham and Christchurch. Much as in Christchurch, the women of southern Dunedin entered politics under the cover of women's organisations, and faced resistance. However, Olssen has argued that women were marginalised from politics in Caverrsham, and perhaps the Caversham women faced stronger resistance. They certainly responded strongly to the local Workingman's Political Committee failure to include women at its candidate selection meeting prior to the 1893 election. Members of the Women's Franchise League and the Dunedin Tailoresses' Union were understandably sore at their exclusion, and the tailoresses resolved to take 'an independent stand.' Both groups disaffiliated from the Workingman's Committee.[39] Women's groups in southern Dunedin remained independent from men's political organisations, in contrast with Christchurch where women established a women's branch of the local Liberal Association. Caversham men's groups did not allow women's groups to become involved. Coupled with the primacy of a political philosophy that Olssen has argued marginalised women, the resistance of Caversham men's political organisations to women's involvement may have led to Caversham women's lower voting rate.

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[38] Annabel Cooper and others, 'The Landscape of Gender Politics: Place, People and Two Mobilisations,' in *Sites of Gender: Women, Men and Modernity in Southern Dunedin 1890-1939*, ed. Barbara Brookes, Annabel Cooper, and Robin Law (Auckland: Auckland University Press, 2003), pp.43-49; Thomlinson, 'We the Undersigned'.

[39] *Press*, 7 October 1893. p.7. Erik Olssen, 'Working Gender, Gendering Work,' in *Sites of Gender*, ed. Barbara Brookes, Annabel Cooper, and Robin Law, pp.57-58,86.

However, when the differences between men's and women's turnout in Christchurch and Caversham are compared, it is clear that there was a larger difference between men's and women's turnout in Christchurch than in Caversham. Relative to men's participation, Caversham women's participation was not unduly low. This suggests that Caversham women's enthusiasm for suffrage worked against the 'persisting resistance' of the male political establishment.

That men's turnout exceeded women's in 1893 is not an unduly surprising result. 1893 was the first election at which women could vote, there was only a short period between the winning of the vote and the election, and a legacy of exclusion, so we would not expect women's voting rate to equal men's. Some historians have suggested that it exceeded men's. This claim usually results from using the inaccurate registration figures rather than population, and was not the case as these figures show.[40] However, Herbert Tingsten has noted that the difference in men's and women's turnout in New Zealand was, from the beginning, 'unusually small' compared with other Western democracies.[41] The small difference suggests women's enthusiasm for suffrage outweighed other factors. It seems likely that the short period between the passing of women's suffrage and the election may have worked to advance women's voting because interest was high, and the media paid a great deal of attention to women's election participation. We can postulate that the looseness of party structures compared with other Western democracies, may have provided less of a barrier to New Zealand women than tight party structures elsewhere. Kristi Anderson found that parties' efforts to bring women into, or keep them out of, polling booths made a difference in American states.[42]

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[40] Atkinson, *Adventures in Democracy*, p.96; Caroline Daley, 'Beyond Suffrage: Gender and Voting Behaviour,' (Wellington: Suffrage Centenary Open Lecture Series Victoria University of Wellington, 1993).

[41] Herbert Tingsten, *Political Behavior: Studies in Election Statistics* (Totowa, New Jersey: Bedminster Press, 1963), p.35.

[42] Kristi Anderson, *After Suffrage: Women in Partisan and Electoral Politics before the New Deal* (Chicago and London: University of Chicago Press, 1996). See also Paula Baker, *The Moral Frameworks of Public Life: Gender, Politics, and the State in Rural New York, 1870-1930* (New York and Oxford: Oxford University Press, 1991); Anna L. Harvey, *Votes without Leverage: Women in American Electoral Politics, 1920-1970* (New York and Cambridge: Cambridge University Press, 1998).

Turnout, 1893 to 1954

The relatively small difference between men's and women's voting rates continued throughout the first half of the twentieth century, but these differences diminished over time. International studies have shown that it can take some time for new groups of voters to integrate into the political system. [43] In New Zealand, women's voting rate was lower than men's until World War Two.

Figure 3.5 shows the overall turnout of men and women for all elections from 1893 until 1954, including the prohibition polls in 1894 and 1919. [44] Turnout was particularly low in the prohibition poll of 1894. Men's and women's turnouts shifted together, both increasing over the period, but men's voting rate was consistently above women's. The difference is starkest in the earliest elections when women were new to voting, and in the wartime elections of 1919 and 1943. During wartime, a significant number of men were on active service, unable to vote, lowering men's voting rate and in fact women's turnout exceeded men's. The trend shown in Figure 3.5 suggests that men's and women's turnout were almost equal in the late 1940s. By 1954 men's and women's turnout was very close at 91.3% of registered voters for men and 91.2% of registered voters for women.

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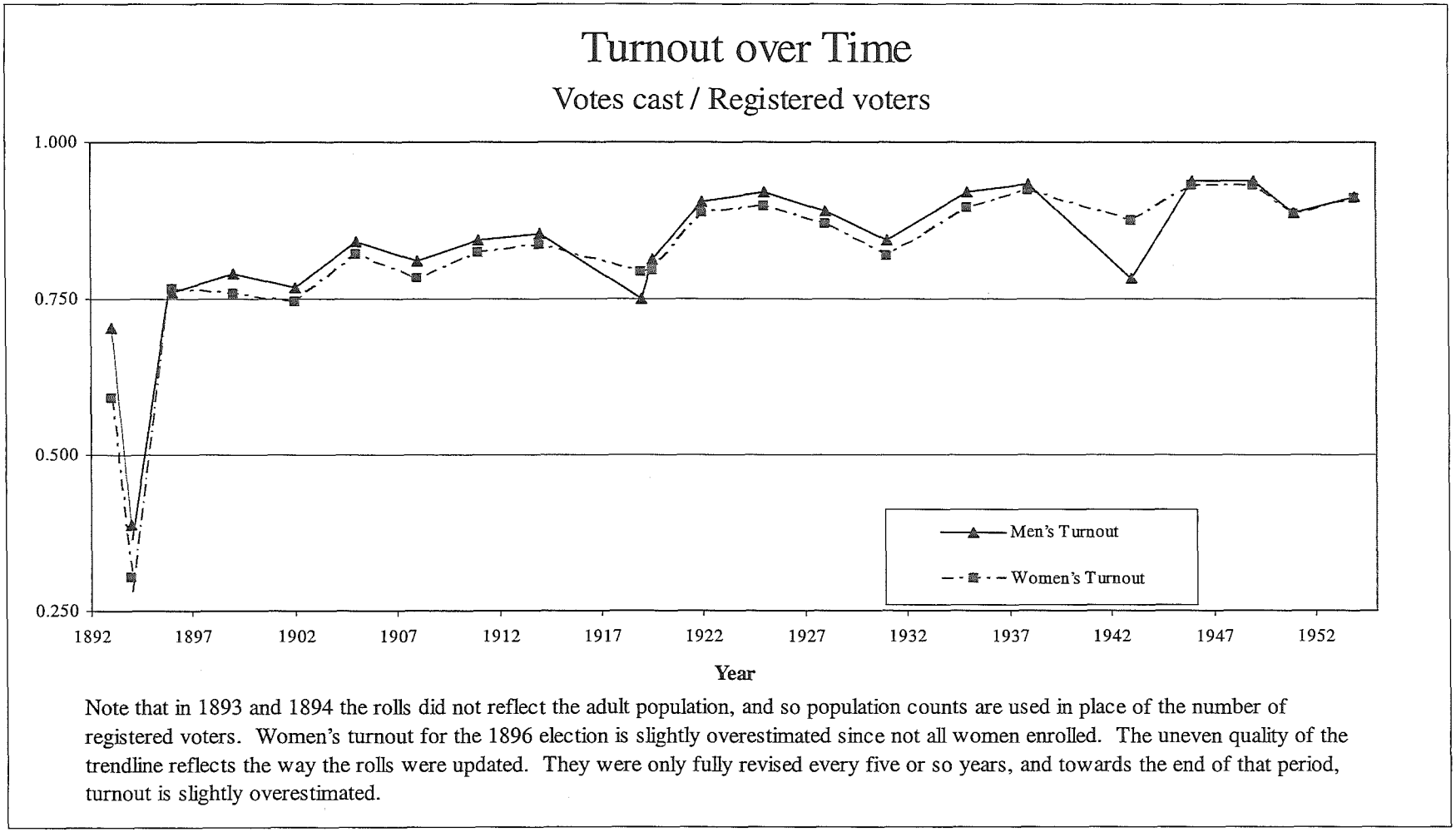
[43] Glenn Firebaugh and Kevin Chen, 'Vote Turnout of Nineteenth Amendment Women: The Enduring Effect of Disenfranchisement,' *American Journal of Sociology* 100, no. 4 (1995); Pippa Norris, 'Gender Differences in Political Participation in Britain: Traditional, Radical and Revisionist Models,' *Government and Opposition* 26, no. 1 (1991); Vicky Randall, *Women and Politics: An International Perspective*, 2nd ed. (Houndmills, Basingstoke: Macmillan, 1987), pp.52-53; Tingsten, *Political Behavior*.

[44] Since from 1893 to 1896 the rolls did not reflect the adult population, population counts taken from the 1896 *Census* are used in place of the number of registered voters for the 1893, 1894 and 1896 elections. Generally, after 1896, the rolls were a reasonable reflection of the adult population. They were, however, more accurate in some years than others. Atkinson notes that the rolls were considered particularly clean in 1905 and 1925, but were less accurate in the early 1950s. Atkinson, *Adventures in Democracy*, pp.111,134,167.

Figure 3.5 Men's and Women's Turnout, 1893-1954



Note that in 1893 and 1894 the rolls did not reflect the adult population, and so population counts are used in place of the number of registered voters. Women's turnout for the 1896 election is slightly overestimated since not all women enrolled. The uneven quality of the trendline reflects the way the rolls were updated. They were only fully revised every five or so years, and towards the end of that period, turnout is slightly overestimated.

Table 3.4 Men's and Women's Total Turnout, 1893 to 1954

Year	Number Elect-orates	Men's Turnout	Women's Turnout	Chi Square all Electorates	Signifi-cance	Left Sided Fisher Exact Test Probability [45]	Number Electorates where Chi Square Test Significant	Number Electorates Left Sided Fisher Exact Test Significant
1893	59	0.705	0.592	4802.2250	<0.0001		57	54
1896	62	0.769	0.688	2898.4088	<0.0001	1.0000	54	50
1899	67	0.791	0.757	591.0250	<0.0001	0.0000	44	40
1902	76	0.768	0.745	884.3141	<0.0001	0.0000	57	58
1905	76	0.841	0.822	286.7873	<0.0001	0.0000	52	48
1908	76	0.811	0.783	673.3031	<0.0001	0.0000	53	51
1911	76	0.844	0.825	405.6303	<0.0001	0.0000	44	41
1914	76	0.854	0.837	342.5670	<0.0001	0.0000	57	48
1919 April Prohibition Poll	76	0.751	0.792	1533.5316	<0.0001	1.0000	56	9
1919 December	76	0.814	0.795	387.3021	<0.0001	0.0000	59	51
1922	76	0.905	0.887	544.3388	<0.0001	0.0000	57	52
1925	75	0.921	0.897	1289.7833	<0.0001	0.0000	60	60
1928	76	0.890	0.870	807.8781	<0.0001	0.0000	55	51
1931	72	0.845	0.820	953.2279	<0.0001	0.0000	61	55
1935	76	0.920	0.895	7.4705	0.0063	0.0034	65	67
1938	76	0.934	0.923	509.2447	<0.0001	0.0000	53	49
1943	73	0.783	0.875	16681.6923	<0.0001	1.0000	70	2
1946	76	0.938	0.931	231.2158	<0.0001	0.0000	46	39
1949	76	0.939	0.932	274.5805	<0.0001	0.0000	35	37
1951	76	0.889	0.885	37.9925	<0.0001	0.0000	36	31
1954	76	0.913	0.912	10.1454	0.0014	0.0007	45	34

Table 3.4 shows the total turnout for men and women from 1893 until 1954. The rate of turnout increased for both men and women over time and the difference between men's and women's turnout diminished from around ten percentage points in the 1893, to less than one percentage point in the late 1940s. In 1893, 41% of women did not vote and 30% of men did not vote. In 1949 the percentages of men and women who did not vote were almost equal: 6.8% of women did not vote and 6.1% of men did not vote. The chi-square test indicates that the difference between men's and women's voting rates is still significant in the 1950s. For all elections, the p-value for the overall chi-square statistic is less than 0.05 so we can reject the null hypothesis of no significant difference between men's and women's voting rates, and conclude that a significant difference existed. The number of individual electorates where the chi-square statistic indicated a significant difference between men's and women's voting rates is also shown in Table 3.4. The wartime prohibition poll of April 1919 provide a break in the pattern, but the number of individual electorates where the chi-square statistic indicates a

[45] I used the statistical package *SAS* to calculate chi-square statistics and the Fisher exact test probabilities. *SAS* was unable to calculate the Fisher probability with sufficient precision for 1893.

significant difference between men's and women's voting rates drops from 57 in 1893 to just 35 in 1949. This was less than half the total number of electorates. The drop reflects the trend towards equal turnout of men and women. The results of the Fisher exact test indicate a similar pattern. For all elections, the overall Fisher probabilities are significant at less than 0.05, so the null hypothesis that women's turnout was greater than or equal to men's can be rejected. Women's turnout was significantly lower than men's. The number of electorates where this claim held dropped over time. In the 1890s in most electorates women's turnout was significantly lower than men's, but by 1949, women's turnout was significantly less than men's in only half of all electorates.

In most Western democracies men's and women's turnout did not even up until the 1970s or '80s.[46] Jack Vowles found a similar pattern in New Zealand when he examined survey data for the elections held in 1963, 1981 and 1990. Vowles' study suggested that men's voting rate still exceeded women's in 1963. Of respondents to the New Zealand Election Survey that year, 14% of women did not vote compared with 8% of men. By the 1981 election, the percentages of men and women respondents who did not vote were equal at 11%. In 1990 the percentage of non-voters was 14% for both men and women.[47]

The counts given with the official election results suggest that the percentages of men and women who did not vote were equal, or at least very close, much earlier in the late forties and early fifties. In 1946, 1949, 1951 and 1954, the percentage of men and women that voted differed by only one percentage point. It seems likely that the early introduction of women's suffrage in New Zealand might have resulted in the early evaporation of any gender gap in voting rates. Comparison between New Zealand and other countries is hindered by lack of consistent data on men's and women's turnout in other places, particularly prior to the introduction of election surveys in the 1950s. Firebaugh and Chen have suggested that differences between the voting rates of American men and women was partly the result of a cohort effect. Women who came of age before the introduction of women's suffrage were less likely to vote throughout their lives. The overall gender gap decreased as these women died.[48] This model would account for the post war evening of men's and women's turnout in New Zealand.

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[46] Norris, 'Gender Differences in Political Participation.'; Randall, *Women and Politics*, pp.52-53.

[47] Jack Vowles, 'Gender and Electoral Behaviour in New Zealand: Findings from the Present and the Past,' in *Women and Politics in New Zealand*, ed. Helena Catt and Elizabeth McLeay (Wellington: Victoria University Press and *Political Science*, 1993), p.124.

[48] Firebaugh and Chen, 'Vote Turnout of Nineteenth Amendment Women.'

Even if gender differences in voting rates did disappear in the post war era, Vowles' work suggests that they reappeared in the 1960s. Table 3.4 shows that the number of electorates where women's turnout was significantly lower than men's, as measured by the Fisher test, slightly increased from 31 in 1951 to 34 in 1954, suggesting that the overall trend towards equal turnout for men and women was uneven. Differences are not inherent, but contingent and transient. Hence, explanations are likely to be complex, and to traverse both broad structural movements and contextual accounts. Structural changes in gender relations, such as shifts in marriage, education and employment patterns, affected the political participation of men and women, reflecting international trends, which suggest that as the socioeconomic status of men and women becomes more similar, their political participation equalises. [49]

Understandings of the nature of gender difference and the nature of politics also shifted over the period, as did levels of feminist consciousness. Definitions of 'separate spheres' shifted. For example, issues such as health, welfare and the family that had previously been seen as part of the private domain and women's sphere, became part of mainstream politics over the first half of the twentieth century. Domestic concerns entered politics. Women took an active role, their political organisation becoming more diverse.[50] After 1919 women could and did stand for Parliament. By 1954 eight women had served as members of Parliament.[51] While this shift helps explain the general trend, more research is needed to determine its relationship with gender difference in turnout at particular elections, but Figure 3.5 suggests that Labour's attention to welfare issues might have increased women's turnout relative to men in 1938.

Vowles found that shifts in the 'status and roles of women' explained only some post war gender differences evident in survey data.[52] Data from the period before World War Two

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[49] On models for differences in men's and women's political participation see Janet A. Flammang, *Women's Political Voice: How Women Are Transforming the Practice and Study of Politics* (Philadelphia: Temple University Press, 1997); Jeff Manza and Clem Brooks, 'The Gender Gap in US Presidential Elections: When? Why? Implications?,' *American Journal of Sociology* 103, no. 5 (1998); Louise A. Tilly and Patricia Gurin, 'Introduction,' in *Women, Politics and Change*, ed. Louise A. Tilly and Patricia Gurin (New York: Russell Sage Foundation, 1990).

[50] Raewyn Dalziel, 'Political Organisations,' in *Women Together: A History of Women's Organisations in New Zealand Nga Ropu Wahine O Te Motu*, ed. Anne Else (Wellington: Historical Branch, Department of Internal Affairs and Daphne Brasell Associates Press, 1993), p.55.

[51] Sandra Wallace, 'Powder-Power Politicians: New Zealand Women Parliamentary Candidates' (PhD Thesis, University of Otago, 1992).

[52] Vowles, 'Gender and Electoral Behaviour in New Zealand,' p.133.

suggest that explanations that rely on shifts in underlying social forces do not explain variations across space. Figure 3.2 shows that for three electorates (the points above the line) women's turnout exceeded men in 1893. There were also several electorates where men's turnout was well above women's (the points closest to the horizontal axis). Table 3.5 gives the number of electorates where women's turnout exceeded men's for the elections 1899 to 1943.[53] Note that this number increases over time, confirming the overall hypothesis that women's and men's turnout equalled over the period.

Table 3.5 Number of Electorates where Women's Turnout exceeded Men's and Heterogeneity Chi-Square Statistics, 1899-1954

Election	Number of Electorates Contested	Number of Electorates where Women's Turnout exceeded Men's (and this Number as a Percentage of the Total Number of Electorates)		Difference between Sum of Electorate Chi-Squares and Overall Chi-Square (Heterogeneity Chi-Square)	Significance
1899	59	9	(15%)	970.4218	<0.001
1902	68	10	(15%)	1868.4538	<0.001
1905	76	12	(16%)	1425.6686	<0.001
1908	76	12	(16%)	956.8820	<0.001
1911	76	19	(25%)	2461.7970	<0.001
1914	76	15	(20%)	1863.8134	<0.001
1919 April Prohibition Poll	76	58	(16%)	2458.4791	<0.001
1919 December	76	17	(24%)	2586.0040	<0.001
1922	75	13	(17%)	1704.8247	<0.001
1925	75	6	(8%)	550.3899	<0.001
1928	76	11	(15%)	1484.5863	<0.001
1931	72	11	(15%)	1318.5546	<0.001
1935	76	3	(4%)	636.6038	<0.001
1938	76	13	(17%)	761.2036	<0.001
1943	74	69	(93%)	447.3259	<0.001
1946	76	14	(18%)	982.2317	<0.001
1949	76	11	(15%)	613.7680	<0.001
1951	76	17	(22%)	1292.2175	<0.001
1954	76	23	(30%)	5305.1007	<0.001

As in 1893, these exceptions are not explained by recourse to electorate based statistical measures. Men's and women's turnout retained similar relationships with population shifts to that it exhibited in 1893 and the data also suggest that gender differences in participation persisted across the rural and urban sectors. The voting rates of men and women in urban and rural electorates from 1899 to 1943 are shown in Figure 3.6 and Figure 3.7. The country quota was abolished in 1945, and no data are available on the proportion of rural and urban dwellers

[53] Note that 1893, 1894 and 1896 are not shown in this table because of problems with the number of registered voters for these elections.

in each electorate after 1945.[54] Early on, there were few urban electorates and many rural electorates, with substantial variation amongst rural electorates. The data for 1899 and 1902 should be interpreted with caution because of the low number of urban electorates. By the end of the period there were 22 urban electorates and just nine rural electorates.

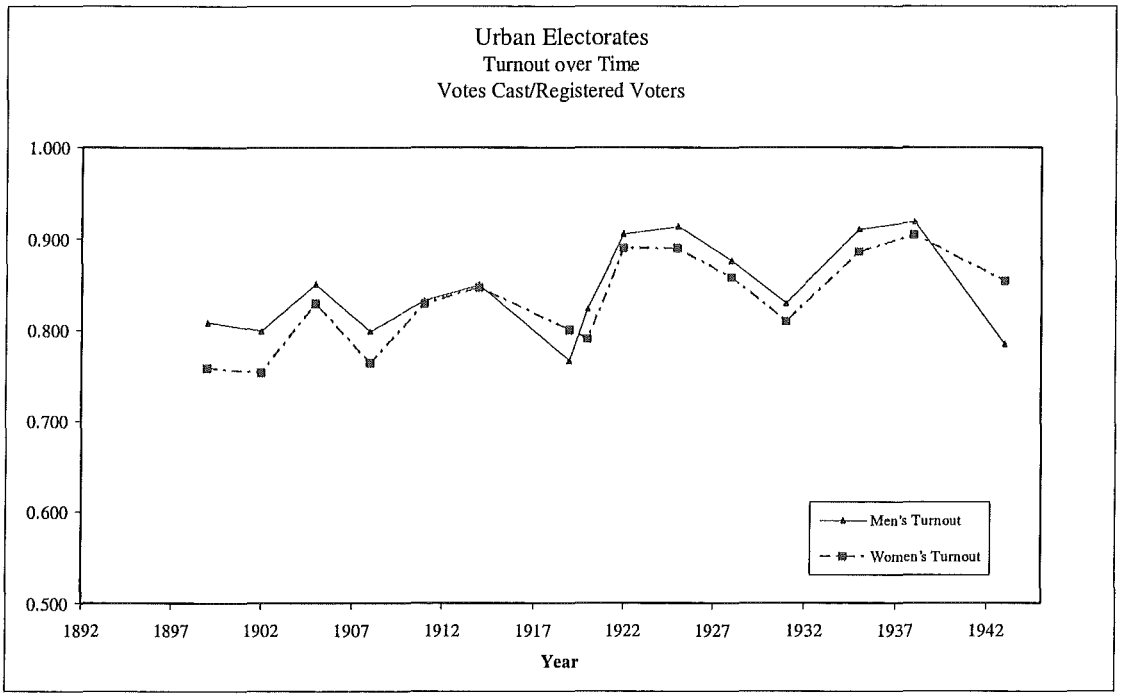

Figure 3.6 Men's and Women's Turnout in Urban Electorates

In both urban and rural electorates, women's turnout exceeded men's in the war years of 1919 and 1943. In rural electorates, men's turnout exceeded women's in all other elections, as it did in urban electorates, although the difference was very small in 1911 and 1914. Excluding the war years, women's turnout was lower than men's in both types of electorates.

[54] Rates for the elections between 1893 and 1896 are omitted because of problems with the rolls and because there was a great deal of variation amongst the many rural electorates. For the purposes of these graphs, urban electorates are defined as those electorates where less than 5% of the population was classified rural, and rural electorates as those electorates where 100% of population lived in rural districts.

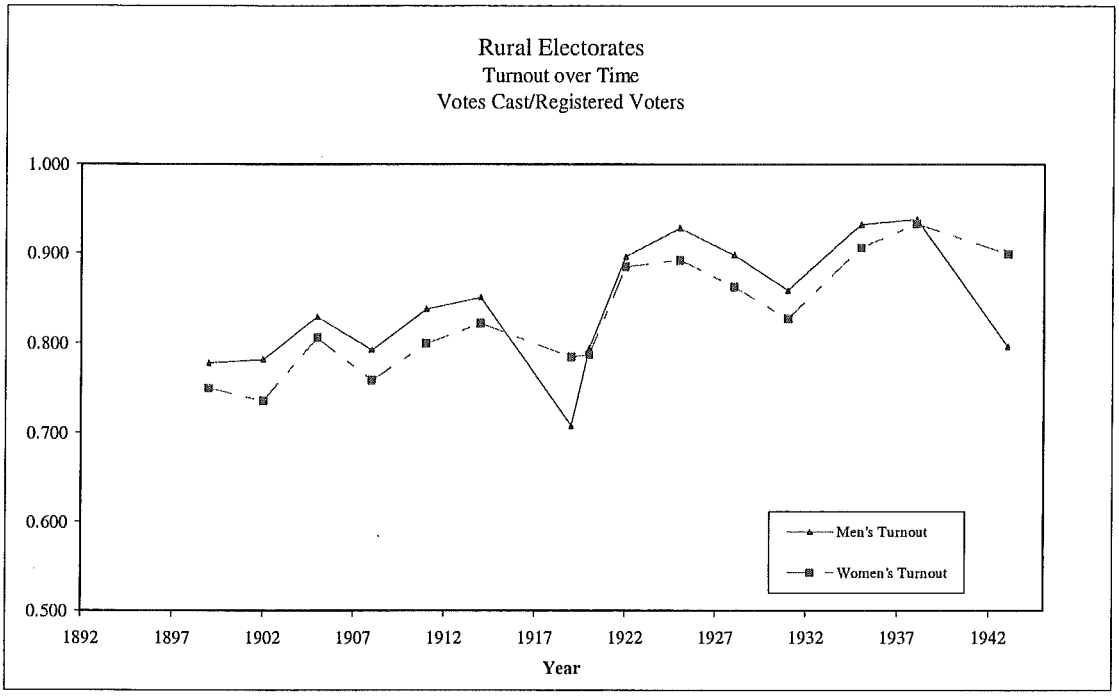

Figure 3.7 Men's and Women's Turnout in Rural Electorates

These analyses don't include factors such as political organisation, language and agendas that influenced men's and women's participation in electoral politics in Christchurch in 1893. The way in which parties mobilised women, and the gendered nature of political language and agendas, have been shown to be important factors in women's participation and partisanship internationally.[55] Work by others suggests these factors were important in New Zealand after 1893. Shifts in ideology and political values were important in post war elections according to Vowles' study. Melanie Nolan found that party structures and male leadership had a detrimental effect on women's political organisation in the inter-war period. Sandra Wallace's study of women candidates confirms that parties did not encourage women's candidature. It seems likely that, once the novelty of suffrage wore off, the same processes that hindered

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[55] See Harvey, *Votes without Leverage;* Mary Hilson, 'Women Voters and the Rhetoric of Patriotism in the British General Election of 1918,' *Women's History Review* 10, no. 2 (2001); David Jarvis, 'The Conservative Party and the Politics of Gender, 1900-1939,' in *The Conservatives and British Society, 1880-1990*, ed. Martin Francis and Ina Zweiniger-Bargielowska (Cardiff: University of Wales Press, 1996); Jon Lawrence and Miles Taylor, 'Introduction: Electoral Sociology and the Historians,' in *Party, State and Society: Electoral Behaviour in Britain since 1820*, ed. Jon Lawrence and Miles Taylor (Aldershot, Hants.: Scolar Press, 1997), pp.18-19; Ina Zweiniger-Bargielowska, 'Explaining the Gender Gap: The Conservative Party and the Women's Vote, 1945-64,' in *The Conservatives and British Society 1880-1990*, ed. Martin Francis and Ina Zweiniger-Bargielowska (Cardiff: University of Wales Press, 1996).

women's party involvement would have hindered women's turnout, even in electorates where women candidates stood.[56]

Such arguments help explain some of the exceptions counted in Table 3.5. Excluding the exceptional war elections, the number of electorates where women's turnout exceeded men's peaked in 1911. The counts of electorates with significant Fisher probabilities shown in Table 3.4 also suggest that 1911 was an unusual year, with the count dropping from 51 in 1908 to 41 in 1911. There were fewer electorates where women's turnout was significantly lower than men's in 1911. Research on women's history suggests several factors that could have been at work to increase women's participation in that year. Narratives of women's organisations indicate that women's groups were active at this time, working to bring women into the political mainstream.[57] Both the Labour Party and the Reform Party had active women's branches.[58] Further research is needed to determine how or if these parties used policy to target women in their election campaigns. There are also clues in the history of the movement for the prohibition of the liquor trade, at its height at this time. Prohibitionists did target women directly. A women's 'crusade' was organised by Annie Sloan of Dunedin, with the campaign slogan 'lips that touch wine shall not touch mine.' Although A. R. Grigg has argued that there is no evidence that women voted for prohibition in large numbers, the fact that women were targeted in an 'all-out effort' in 1911 may have increased their turnout at the polls, if not the number of votes for prohibition.[59] Attention to party organisation and propaganda and political language might suggest factors that constrained the growth of men's voting in these electorates.

Figure 3.6 and Figure 3.7 suggest that patterns were different in urban and rural areas in 1911 and 1914. The difference between men's and women's turnout was very small in urban electorates compared with rural electorates. The grouping of electorates does hide variation. In 1911 for example, men's turnout exceeded women's in fourteen of the seventeen urban

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[56] Melanie Nolan, 'Gender and the Politics of Keeping Left: Wellington Labour Women and Their Community, 1912-1949,' in *Communities of Women: Historical Perspectives*, ed. Barbara Brookes and Dorothy Page (Dunedin: University of Otago Press, 2002); Wallace, 'Powder-Power Politicians'.

[57] Dalziel, 'Political Organisations,' p.59.

[58] Nolan, 'Gender and the Politics of Keeping Left.' The activities of the women's branches of the Reform Party are yet to be tackled by historians, but the Reform Party magazine *Light and Liberty* tracks their work in 1913 and 1914. I am grateful to John Edmundson for pointing this out.

[59] Raewyn Dalziel, 'New Zealand Women's Christian Temperance Union,' in *Women Together*, p.73; A. R. Grigg, 'Prohibition and Women: The Preservation of an Ideal and a Myth,' *New Zealand Journal of History* 17, no. 2 (1983).

electorates. Of the nineteen electorates where women's turnout exceeded men's, only three were urban electorates, and six were urban electorates.[60] Further research is needed, but the overall difference between urban and rural electorates may also be able to be traced back to political organisation. Women's Political Reform Leagues were first established in urban centres over this period. Branches were established in Wellington in 1908, Christchurch in 1912, Auckland in 1913.[61]

Further research into parties' attempts to target women voters is required, but the anecdotal evidence suggests that parties did seek women's votes over the early to mid twentieth century. Robert Chapman noted full page newspaper advertisements encouraging women to vote Reform at the 1925 election. Elizabeth McCombs booklet, *Women and the Labour Movement*, targeted women. Significantly, by the post war period, both Labour and National were paying specific attention to women voters with publications like the Labour Party's *Women's Place in the Sun* and National's *A Family Affair*.[62]

A final test of the importance of local factors on gender difference in turnout compared with the influence of broad structural and attitudinal shifts can be made by comparing the chi-square statistics for individual electorates with the chi-square statistics for all electorates. Did the individual electorates show a similar pattern to that of all electorates combined? A heterogeneity test may be carried out by comparing the sum of the chi-square statistics for each electorate with the overall chi-square statistic. Here the null hypothesis is that the electorates are homogeneous, that is the electorates show similar relationships between gender and voting rates. The alternative hypothesis is that the electorates are heterogeneous, or show different relationships between gender and voting rates. If the difference between the sum of the electorate chi-squares and the total chi-square is significant (less than 0.05), then

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[60] The electorates where women's turnout exceeded men's in 1911 were Dunedin West, 0, Wellington Central, 0, Wellington North, 0, Waitemata, 0.216, Lyttelton, 0.225, Grey, 0.562, Masterton, 0.598, Thames, 0.711, Mataura, 0.7356, Waipawa, 0.74, Oroua, 0.756, Westland, 0.811, Kaiapoi, 0.884, Awarua, 1, Hurunui, 1, Otago Central, 1, Otaki, 1, Waimarino, 1, Wairarapa, 1. The number given after each electorate name is the rural population proportion for each electorate. 0 indicates all-urban, 1 indicates all-rural.

[61] *Light and Liberty*, 27 May 1913, pp.27-31.

[62] Chapman, 'The Significance of 1928', p.40; Melanie Nolan, *Breadwinning: New Zealand Women and the State* (Christchurch: Canterbury University Press, 2000), pp.193-197. *A Family Affair*, (Auckland: New Zealand National Party, [1949]); Elizabeth R. McCombs, *Women and the Labour Movement* (Wellington: New Zealand Worker, 1933); *Women's Place in the Sun*, (Wellington: New Zealand Labour Party, 1946).

the null hypothesis can be rejected. These values are listed in Table 3.5 for 1899-1954. The difference between the chi-square statistics was significant for all elections, indicating that there was substantial local variation in differences between men's and women's turnout.

Overall, the pattern of men's and women's turnout shows that women were less likely to vote than men over the first half of the twentieth century. This gives support to the marginalisation thesis. This difference was never large, but occurred across all electorates, and varied over time. The extent of the difference responded to broad social changes. The evidence suggests that it also responded to changes in the political establishment. Women's turnout increased as political groups appealed to women organisationally and through policy. By the late 1940s, the difference had largely disappeared. Men's turnout significantly exceeded women's in only half of all general elections.

A caveat to arguments based on gender must be that some variations in participation rates are still masked by the data. There were plenty of differences not only between but amongst men and women. Gender is one factor that shaped political participation, but individuals' behaviours at the ballot box were shaped by a multiplicity of factors. Political scientists' studies of more recent electoral politics have suggested that a range of factors, including gender, but also family, ethnicity, age, education and class, not to mention partisan opinions, can influence voting behaviour.[63] Yet what this analysis shows is that gender clearly was a factor in electoral participation throughout the first half of the twentieth century, even if mediated by other factors.

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[63] Martin Holland, 'Introduction: Understanding Electoral Behaviour,' in *Electoral Behaviour in New Zealand*, ed. Martin Holland, Oxford Readings in New Zealand Politics (Oxford: Oxford University Press, 1992).

Chapter 4
The Analysis of Voting Outcomes by Gender: Methodologies and Caveats[1]

A qualitative examination of the results for the 1893 election in Christchurch could not reveal men's and women's voting choices. In this chapter I turn to quantitative methods, and review and trial techniques for inferring men's and women's unknown party votes from aggregate data. Men's and women's party and prohibition votes are unknown, and only electorate data are available. Analysis of the available electorate data is complicated by the ecological fallacy which refers to the error of assuming that patterns evident in aggregate or group data also apply at the individual level. For example, take a case where electorates with a high proportion of women amongst voters had higher Liberal votes than electorates with fewer women amongst the voters. The ecological fallacy indicates that it would be wrong to conclude that women supported the Liberals. Electorate with high proportions of women voters may have other characteristics that led them to support the Liberals.

Since Robinson's identification of the ecological fallacy in 1950, a number of methods for ecological inference have been proposed. These methods use the information that is available in the data, along with some assumptions to compensate for lost information, to estimate the unknown values, which are in this case, men's and women's party and prohibition votes. This

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[1] This chapter forms the basis of a forthcoming article: Eric J. Beh, Linda Moore, Irene L. Hudson, and D. G. Steel, 'An Empirical Evaluation of Ecological Inference Techniques: Gender and Turnout at New Zealand Elections, 1893 - 1919' to be submitted to the *Journal of the Royal Statistical Society Series C*. I am extremely grateful to Dr Beh for allowing me to use unpublished material and for assisting with analysis. In particular, Dr Beh provided estimations based on the homogeneous and semi-parametric methods, calculated V-values and drew some of the graphs in this chapter. Dr Beh also allowed me to use unpublished material (namely David G. Steel, Eric J. Beh, and R. L. Chambers, 'The Information in Aggregate Data' (To appear in King, Gary, Ori Rosen and M. Tanner, Eds., *Ecological Inference: New Methodological Strategies*, Cambridge: Cambridge University Press, 2004, pp.51-68) (2002); Eric J. Beh, 'Ecological Inference: A Discussion [Seminar Presentation],' (University of Canterbury: July 2003) and Eric J. Beh, 'Ecological Inference: The Homogeneous Approach [Seminar Presentation],' (University of Canterbury: July 2003)).

chapter is in four sections. The first section reviews the information that is available in aggregate data and considers the problem of aggregation bias. The details of six methods for ecological inference are detailed in the next section. These methods are Goodman's ecological regression, the neighbourhood method, King's parametric and non-parametric methods, a semi-parametric approach, and the homogeneous method. In the third section, the extent of aggregation bias in the data-set is assessed. In the final section of the chapter, methods for ecological inference are tested on data describing turnout. The estimates produced for men's and women's turnout can be compared to the known true values to assess the performance of the methods.

How does an historian choose the best model from an array of models? There are five main considerations. Firstly, do the assumptions fit the data? All ecological inference methods make assumptions about the data to compensate for the loss of information in aggregation. Some assumptions are untestable, but others have discernible real life implications that may or may not be plausible. Secondly, statisticians' evaluations of the various models can point to theoretically better approaches. For example, there has been loud criticism over some aspects of Gary King's approach to ecological inference.[2] Thirdly, Salway and Wakefield have suggested that plausibility and consistency of results are important indicators of a model's success.[3] This point emphasises

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[2] King himself criticised Goodman's methods. Gary King, *A Solution to the Ecological Inference Problem: Reconstructing Individual Behavior from Aggregate Data* (Princeton, New Jersey: Princeton University Press, 1997), pp.56-73. Debate over King's methods can be found in Wendy K. Tam Cho, *Iff the Assumptions Fit: A Comment on the King Ecological Inference Solution*(1998, accessed 24 June 2002); available from web.polmeth.ufl.edu/papers/98/cho98.pdf; D. A. Freedman, S. P. Klein, M. Ostland, and M. R. Roberts, '[Book Review] a Solution to the Ecological Inference Problem, G. King,' *Journal of the American Statistical Association* 93, no. 444 (1998); D. A. Freedman, M. Ostland, M. R. Roberts, and S. P. Klein, 'Response to King's Comment [Letter to the Editor],' *Journal of the American Statistical Association* 94, no. 445 (1999); Gary King, 'The Future of Ecological Inference Research: A Comment on Freedman Et Al. [Letter to the Editor],' *Journal of the American Statistical Association* 94, no. 445 (1999); D. Stephen Voss, *Ecological Inference and Contextual Research: In Pursuit of the Southern Cross-Tab* (Prepared for the New Advances in Ecological Inference Conference, Centre for Basic Research in the Social Sciences, Cambridge, Ma, June 2002) (2002, accessed 25 June 2002); available from www.cbrss.harvard.edu/events/eic/papers/voss.pdf.

[3] Ruth Salway and Jonathon Wakefield, *A Comparison of Approaches to Ecological Inference in Epidemiology, Sociology and Political Science* (To appear in King, Gary, Ori Rosen and M. Tanner, Eds., Ecological Inference: New Methodological Strategies, Cambridge: Cambridge University Press, 2004)

the value of combining quantitative analysis with qualitative studies. Without contextual knowledge, the plausibility of results cannot be assessed.

Fourthly, tests of methods for ecological inference rely largely on empirical evaluation using data-sets where the truth is known. Estimates are compared with known true values for these data-sets. Previous evaluations using a variety of data-sets can help assess the accuracy of different methods, but the success of an empirical evaluation is dependent on the particular data-set used.[4] A method may produce reasonable results for one data-set, but not another. Although ecological inference is often applied to voting data, few trials look at gender; most concentrate on race or voting transition between elections.[5] Hence there are few published trials using data similar to the data-set considered here.[6] Data on men's and women's turnout in New Zealand is

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(2002, accessed 11 March 2004); available from www.cbrss.harvard.edu/events/eic/nov/wakefieldsalway.ps.

[4] Most authors that suggest a new method for ecological inference provide empirical examples, but see Voss and Cleave for empirical evaluations of a variety of methods. N. Cleave, P. J. Brown, and C.D. Payne, 'Evaluation of Methods for Ecological Inference,' *Journal of the Royal Statistical Society Series A (Statistics in Society)* 158, no. 1 (1995); Voss, *Ecological Inference and Contextual Research.*

[5] See J. Morgan Kousser, 'Evaluating Ecological Inference: An Introduction,' *Historical Methods* 34, no. 3 (2001) and the subsequent articles in Volume 34 of *Historical Methods.*

[6] Two political scientists, Kevin Corder and Christina Wolbrecht, have been working with United States data on gender and voting, but their results are preliminary at this stage. The United States data provides few opportunities for comparison of estimates with known true values, although in some states men's and women's turnout were separately recorded. J. Kevin Corder and Christina Wolbrecht, *Participation by New Voters: The Case of American Women* (Prepared for Sened, Itai, and Andrew Sobel, Eds., Visualizing Politics) (2001, accessed 25 June 2002); available from catt.friedmann.wmich.edu/vpcw2002.pdf; J. Kevin Corder and Christina Wolbrecht, *Women's Turnout after Suffrage: New Answers to Old Questions.* (Prepared for Delivery at the 2001 Annual Meeting of the American Political Science Association, San Francisco, August 29-September 2 2001) (2001, accessed 25 June 2002); available from pro.harvard.edu/papers/117/117001WolbrechtC.pdf; J. Kevin Corder and Christina Wolbrecht, *Using Prior Information to Aid Ecological Inference: A Bayesian Approach* (Prepared for the New Advances in Ecological Inference Conference, Centre for Basic Research in the Social Sciences, Cambridge, Ma, June 2002) (2002, accessed 25 June 2002); available from catt.friedmann.wmich.edu/kc-cw-ei.pdf; Christina Wolbrecht and J. Kevin Corder, *Gender and the Vote* (Paper Prepared for Delivery at the 1999 Annual Meeting of the American Political Science Association, Atlanta, 2-5 September1999) (1999, accessed 24 June 2002); available from unix.cc.wmich.edu/~corder/apsa1999.pdf.

likely to be much more like the New Zealand data on party and prohibition vote than overseas data on race. If a method for ecological inference is able to produce good estimates for gendered turnout, compared with the truth, its estimates for gendered party and prohibition votes should also be reasonable. Testing methods on turnout data will help identify the best methods for use in the case of party and prohibition vote.

Finally, methods must be selected on practical grounds. Seldom are historians also statisticians, and the relatively complex mathematics involved in newer methods for ecological inference can be a huge barrier to its use in history where readers are often unversed in statistical techniques. Hence simpler or more widely understood methods may have advantages over statistically better but more complex methods. Unfortunately, the simplest methods for ecological inference are, at best, unreliable. As one reviewer put it:

> Methods for analysis and estimation may be chosen on theoretical, empirical and practical grounds. Much weight is sometimes given to the last of these, which can lead to the use of easily implemented but inappropriate methods.[7]

What this means in practice for an historian, is that any use of methods for ecological inference must be accompanied by an explanation of the statistical methodology. In other words, statistical theory cannot be avoided and readers should be forewarned that this chapter more mathematics than is usual in a history thesis. However, in many cases, the best method may be one that balances ease of implementation with theoretical advantages. Some statistical assumptions are more reasonable than others. If historians are to use these techniques, they must understand these assumptions, but consideration should also be given to ease of implementation and the currency of the various techniques throughout the discipline.

What Information is Available?

Before examining methods for ecological inference, it is necessary to set out the information that is available. New Zealand election data are classified by electorates. Official results for elections between 1893 and 1954 included separate counts of the number of men and the number of women who cast a vote and counts of the number of votes each candidate received. Newspapers published lists of candidates' party affiliations. These three information sources, the official counts of the number of men and women voting, the official counts of candidates' votes and the newspaper lists of candidate affiliations, can be linked for each electorate to provide information

[7] Cleave, Brown, and Payne, 'Evaluation of Methods for Ecological Inference,' p.70.

about party voting. However, the key problem is that only electorate data are available, and while men's and women's turnout is known for each electorate, men's and women's party and prohibition votes are not known. Only the total electorate party and prohibition votes are known.

Consider the question of men's and women's party voting. The known information can be displayed in a contingency table like the following:

Table 4.1 Party Voting in the Electorate j, 1893

1893	Liberal Candidate	Other Candidates	Total
Women	v_{flj} β_{bj}	v_{foj} $1-\beta_{bj}$	v_{fj} x_j
Men	v_{mlj} β_{wj}	v_{moj} $1-\beta_{wj}$	v_{mj}
Total	v_{jl} = t_j =	v_{oj}	n_j

The known quantities for electorate j are:

v_{fj} = number of women who voted;

x_j = proportion of votes cast by women= $v_{fj} / (v_{fj} + v_{mj})$;

v_{mj} = number of men who voted;

v_{lj} = number of votes cast for the Liberal candidate;

v_{oj} = number of votes cast for other candidates;

t_j = proportion of votes cast for the Liberals = $v_{lj} /(v_{lj} + v_{oj})$;

n_j = total number of votes cast = $v_{fj} + v_{mj}$.

The unknown quantities are:

v_{flj} = number of votes cast by women for the Liberal candidate;

β_{bj} = proportion of women who voted Liberal = v_{flj} / v_{fj};

v_{mlj} = number of votes cast by men for the Liberal candidate;

β_{wj} = proportion of men who voted Liberal = v_{mlj} / v_{mj};

v_{foj} = number of votes cast by women for other candidates;

$1-\beta_{bj}$ = proportion of women who voted for other candidates = v_{foj} / v_{fj};

V_{moj} = number of votes cast by men for other candidates;

$1-\beta_{wj}$ = proportion of men who voted for other candidates = V_{moj} / V_{mj}.[8]

Thus, for the electorate of Riccarton, we have the following table:

Table 4.2 Party Voting in the Riccarton Electorate, 1893

Riccarton, 1893	Liberal (Russell)	Other candidates (Boag, opposition)	Total
Women	V_{flj} β_{bj}	V_{foj} $1-\beta_{bj}$	V_{fj} =1417 x_j = 0.4839
Men	V_{mlj} β_{wj}	V_{moj} $1-\beta_{wj}$	V_{mj} =1511
Total	V_{jl} =1517 t_j = 0.5181	V_{oj} =1411	n_j = 2928

The quantities of interest are β_{bj}, women's Liberal votes/ women's total votes in each electorate, and β_{wj}, men's Liberal votes/men's total votes. Note that these unknowns are proportions. They can be interpreted as women's and men's preferences for the Liberal candidate.

In 1893, in a number of electorates, no Liberal candidate stood, or there was more than one Liberal candidate. Consider 32 electorates where one Liberal candidate stood, so that there are 32 tables like Table 4.2. Not all were two-way contests: in eleven electorates the Liberal candidate

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[88] Note that the notation used here is shaped by a number of constraints. Gary King's method dominates historians' use of ecological inference, and so it seemed most logical to follow his notation. That also allowed the use of graphics from King's software, EzI, without modification. However, King's notation was based on an example where he estimated the turnout of black and white voters at United States elections. Hence he named the unknowns β_{bj} and β_{wj} for black and white turnout respectively. King used x_j for the black proportion of the voting population and t_j for the total turnout, that is votes cast/eligible population. The same notation is used here, although that means that β_w represents men's voting, not women's nor white voting. The notation for the internal cells is designed to make it easy for a non-mathematician. 'F' is a pneumonic for women's votes and 'm' for men's. Letters also represent vote choices: 'L' stands for Liberal, and 'o' for other. Note that King's notation can be misleading since it does clearly not distinguish between estimates and parameters. Moreover, his method entails a number of re-parametrisations. King, *A Solution to the Ecological Inference Problem*, pp.28-34.

faced more than one opponent. In these electorates, the 'other' column shows the votes for more than one candidate. The table for the Avon electorate is shown in Table 4.3. There were three candidates in Avon, the Liberal William Tanner, George MacIntyre, an independent, and J. L. Wilson, who supported the opposition. Tanner won the seat with 1,719 votes, beating McIntyre's 1,066. Wilson came a definite last with only 405 votes.

Table 4.3 Party Voting in the Avon Electorate, 1893

Avon, 1893	Liberal (Tanner)	Other candidates (MacIntyre and Wilson)	Total
Women	V_{flj} β_{bj}	V_{foj} $1-\beta_{bj}$	V_{fj} =1732 x_j = 0.5429
Men	v_{mlj} β_{wj}	v_{moj} $1-\beta_{wj}$	v_{mj} =1458
Total	v_{jl} =1719 t_j = 0.5388	v_{oj} =1471	3190

In an election where P electorates were contested, there are P electorate contingency tables, and two further quantities of interest are the aggregate quantities β_b and β_w, which are the weighted averages of the electorate values. These values describe voting in all electorates, that is, in the aggregation of the P electorates. Here, β_b refers to women's preference for Liberal candidates in all 32 electorates. β_w refers to men's preference for Liberal candidates across all 32 electorates.

$$\beta_b = \frac{v_{fl}}{v_f} = \sum_{j=1}^{P} \frac{n_j \beta_{bj}}{n}$$

and

$$\beta_w = \frac{v_{ml}}{v_m} = \sum_{j=1}^{P} \frac{n_j \beta_{wj}}{n}$$

where $v_{fl} = \sum_{j=1}^{P} v_{flj}$, women's Liberal votes in all electorates

$v_f = \sum_{j=1}^{P} v_{fj}$, votes cast by women in all electorates;

and similarly for v_{ml} and v_m.

$$n = \sum_{j=1}^{P} n_j$$

We also have the aggregate quantities

$$v_l = \sum_{j=1}^{P} v_{lj}\ , x = \frac{v_f}{n}, t = \frac{v_l}{n}.$$

Table 4.4 Bounds on Party Voting in the Riccarton Electorate, 1893

Riccarton, 1893	Liberal (Russell)	Opposition (Boag)	Total
Women	$6 < v_{flj} < 1417$ $0.0042 < \beta_{bj} < 1$	$0 < v_{foj} < 1411$ $0 < p_{foj+} < 0.9958$	$v_{fj} = 1417$ $x_j = 0.4839$
Men	$100 < v_{mlj} < 1511$ $0.0662 < \beta_{wj} < 1$	$0 < v_{moj} < 1411$ $0 < p_{moj} > 0.9338$	$v_{mj} = 1511$
Total	$v_{jl} = 1517$ $t_j = 0.5181$	$v_{oj} = 1411$	$n_j = 2928$

Although the values of the internal cells are unknown, the values in the external cells, known as the marginals, do place limits on the possible values for the internal cells. The internal cell entries must fall within a certain range to sum to the values in the marginal cells. The minimums and maximums for women's Liberal vote, β_{bj} and men's Liberal vote, β_{wj}, shown for Riccarton in Table 4.4, are given by the following equations:

$$max(0, \frac{t_j - (1 - x_j)}{x_j}) \leq \beta_{bj} \leq min(\frac{t_j}{x_j}, 1)$$

$$max(0, \frac{t_j - x_j}{1 - x_j}) \leq \beta_{wj} \leq min(\frac{t_j}{1 - x_j}, 1).$$

The electorate bounds combine to provide bounds on the overall quantities, so that for 32 electorates with one Liberal candidate in 1893, women's overall Liberal vote proportion falls between 0.0271 and 0.9532, and men's Liberal vote proportion falls between 0.1754 and 0.7812. In other words, a maximum of 95% of women voted Liberal in those electorates, and a minimum of 3%. A maximum of 78% of men supported the Liberal candidate, and a minimum of 18%. King notes that the combination of electorate bounds generally produces narrower bounds than merely using overall counts to determine the bounds on β_b and β_w. In this case, calculating bounds

from a contingency table that combines all electorates gives the following bounds: $0< \beta_b < 1$ and $0.1448 < \beta_{wj} < 0.7989$, wider than the bounds cited above which sum electorate bounds.[9] The contingency table for party voting in all 32 electorates is shown in Table 4.5.

Table 4.5 Bounds on Party Voting in 32 Electorates, 1893

1893	Liberal	Other	Total
Women	$0< v_{fl} <39030$ $0< \beta_b < 1$	$0< v_{fo} < 39030$	$v_f =39030$ $x = 0.3954$
Men	$8641 < v_{ml} < 47671$ $0.1448 < \beta_w < 0.7989$	$12002 < v_{mo} < 51032$	$v_m =59673$
Total	$v_l =47671$ $t = 0.4830$	$v_o =51032$	$n = 98703$

The marginal frequencies also determine the relationship between β_{bj} and β_{wj} in a particular electorate. If either β_{bj} or β_{wj} is known, the other can be determined by the following relationship, known as the accounting identity.

$$t_j = \beta_{bj} x_j + \beta_{wj} (1-x_j)$$

The accounting identity expresses the total party vote as a combination of women's party votes and men's party votes. There is a linear relationship between men's and women's votes for the Liberal candidate. The relationship between the overall values is determined by a similar equation

$$t = \beta_b x + \beta_w (1-x).$$

Since x_j and t_j are known, the accounting identity can be re-arranged to describe a line for each electorate, known as a tomography line:

$$\beta_{wj} = \frac{t_j}{1-x_j} - \frac{x_j}{1-x_j}\beta_{bj}$$

The overall tomography line is given by

$$\beta_w = \frac{t}{1-x} - \frac{x}{1-x}\beta_b$$

These lines give a graphical representation of the possible values for the unknowns.[10] Figure 4.1, a tomography plot, displays the tomography lines for 32 electorates where one Liberal candidate

[9] King, *A Solution to the Ecological Inference Problem*, p.84.

stood in 1893. For each electorate, the true proportions of men (β_{wj}) and women (β_{bj}) supporting Liberal candidates must lie on the relevant line. Riccarton is represented by a dashed line, and the overall tomography line is represented by a dotted line.

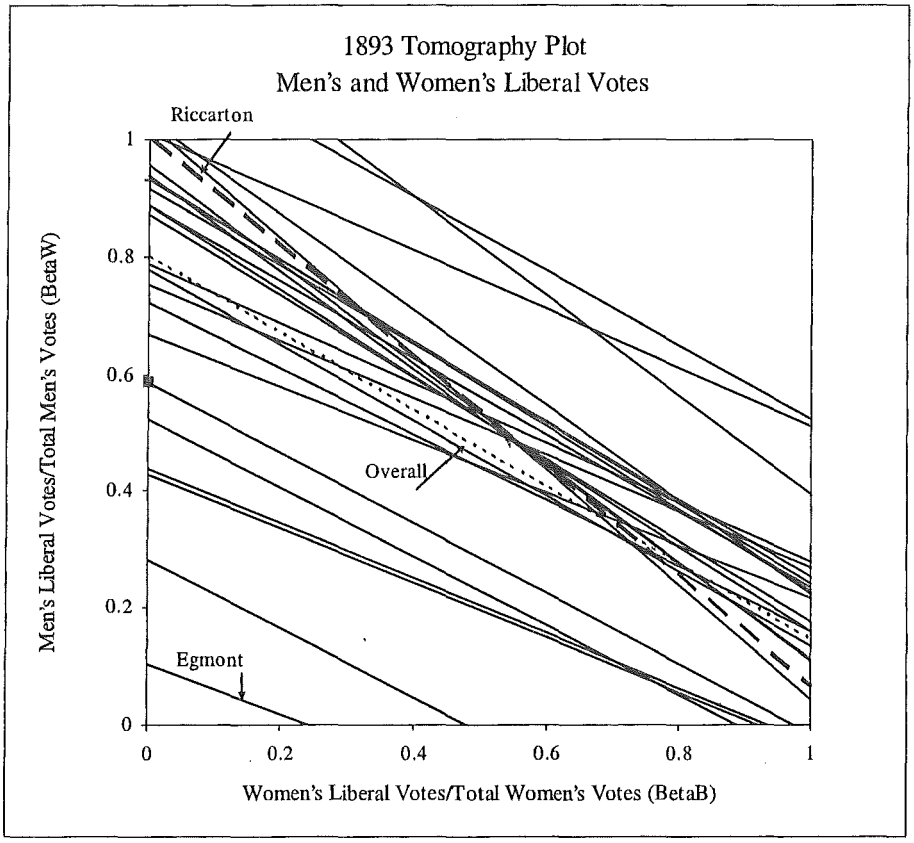

Figure 4.1 Tomography Plot for Liberal Voting in 32 Electorates in 1893

The spread of the lines in the tomography plot reflects the width of the bounds. The lines in Figure 4.4 spread across the length of the y and x axes. In some cases, the bounds on the internal cells can be narrow, providing substantial information about the unknown quantities. Inferring the values of the unknown internal cells from the known bounds is known as the method of bounds, and was first suggested by Duncan and Davis in 1953, and extended by King in 1997.[11] Here, the

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[10] King pioneered the use of this graphic. King, *A Solution to the Ecological Inference Problem*, pp.79-83.

[11] Otis Dudley Duncan and Beverly Davis, 'An Alternative to Ecological Correlation,' *American Sociological Review* 18, no. 6 (1953); King, *A Solution to the Ecological Inference Problem*, pp.79,301-303.

bounds are wide and do not provide much information about the unknown values of β_{bj} and β_{wj}. The lines are generally long, indicating that there is a large range of possible solutions. One electorate, Egmont, represented by the bottom left line, has a short line. The possible values for this electorate occupy a much smaller range.

Table 4.6 Proportion of Votes cast by Women, 1893-1919

Year	Number of Electorates (Excludes Uncontested)	Votes Cast by Women / Total Votes Cast	Minimum	Maximum
1893	59	0.4101	0.2607	0.5190
1896	62	0.4212	0.2163	0.5118
1899	59	0.4280	0.3181	0.5196
1902	68	0.4346	0.3120	0.5761
1905	76	0.4413	0.2568	0.5419
1908	76	0.4435	0.2683	0.5931
1911	76	0.4501	0.2734	0.5677
1914	76	0.4501	0.2970	0.5536
1919	76	0.4744	0.3444	0.5667

One reason the bounds are wide is that gender proportions generally do not come close to 0 or 100%: there are no all women or all-men electorates. Such groups are called 'homogeneous' or uniform on the x-value, and generally contain more information about internal cell values. When homogeneous groups exist, conclusions can be drawn from behaviour in these groups. In the previous chapter, the behaviour of uniformly rural and urban electorates could be compared to make conclusions about the behaviour of rural and urban voters. By contrast, in mixed electorates, the votes of urban and rural electors are pooled, and vote counts provide little information about differences in the behaviour of members of these groups. Since there are no all-women or all-men groups of voters delineated in the official election statistics, it is impossible to utilise homogeneous groups in the analysis of the 1893 election. Table 4.6 shows the proportion of votes cast by women from 1893 until 1919. Overall, in electorates where a vote was held in 1893, 41% of the votes cast were cast by women, and so 59% were cast by men. Looking at the electorate level, the percentage of votes cast by women varied from 26% to 52%. The proportion of votes cast by women increased over time, but its range did not substantially change. No electorates had close to 100% women or 100% men. Unanimity on the outcome variable, t_j, can

also narrow bounds, but there were few New Zealand electorates where voters' party preferences were even close to unanimous.

Aggregation Bias

A final consideration prior to reviewing methods for ecological inference is the presence of aggregation bias. Aggregation bias is intimately entwined with the problem of the ecological fallacy and is a major problem for researchers wishing to analyse aggregate data. The term refers to the discrepancies between the expected values of parameters at the aggregate level and the individual level, and results from the loss of information during aggregation. A number of different patterns at the individual level can lead to the same aggregate result. As a result, aggregate measures are likely to be biased, and without individual level data, the nature and extent of the bias cannot be characterised.

The characterisation of aggregation bias differs throughout the literature, and is often linked to the empirical problem under discussion. Salway and Wakefield have noted the different issues which epidemiological and political applications of ecological inference face.[12] Nevertheless, the problem of aggregation bias can be divided into three sub-problems. The first, known as the modifiable area unit problem, is that aggregate measures can differ according to the level of aggregation, as Robinson discovered. Robinson found that the correlation between illiteracy and foreign birth based on data describing the geographical areas defined by United States census divisions were not the same the correlation based on data describing states. Changing geographical boundaries modified the result.[13]

The second problem is whether parameters vary between groups. In practice they often do, but many models assume this variation is limited. A common technical definition for the absence of aggregation bias, is the presence of mean independence, that is $E(\beta_{bj} \mid x_j) = B_b$ and $E(\beta_{wj} \mid x_j) = B_w$. Making the assumption that mean independence exists is equivalent to

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[12] Salway and Wakefield, *A Comparison of Approaches to Ecological Inference.*

[13] W. S. Robinson, 'Ecological Correlations and the Behaviour of Individuals,' *American Sociological Review* 15, no. 3 (1950); D. G. Steel and D. Holt, 'Rules for Random Aggregation,' *Environment and Planning A* 28 (1996).

assuming that variation between groups is limited.[14] Applying this assumption to data on gender and Liberal voting would mean assuming that, dependent on the proportion of women in the electorate, the proportion of women voting Liberal was similar across all electorates, and the proportion of men voting Liberal was similar across all electorates.

The third problem is not unique to aggregate data. The importance of contextual or confounding variables that are not or cannot be accounted for in a model can also cause aggregation bias. For example, Langbein and Lichtman have noted that Robinson's analysis of literacy excluded a measure of educational level, producing bias in his model. As Kousser and others have suggested, it is vital to include any independent variable that influences the outcome. This is a particular problem for voting studies, since so many variables can influence voting preferences. [15]

Most models make assumptions to overcome the problem of aggregation bias. The crux of the ecological fallacy and ecological inference is that the plausibility of these assumptions can seldom be checked on the basis of group data alone.

Techniques for Ecological Inference

Goodman's Ecological Regression

Leo Goodman was the first to suggest using the accounting identity to infer values of the unknown internal cell values. Goodman proposed using a simple linear regression. The accounting identity can be re-arranged as a linear function of x_j.

$$t_j = \beta_{bj} x_j + \beta_{wj} (1-x_j)$$

$$= (\beta_{bj} - \beta_{wj}) x_j + \beta_{wj}$$

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[14] King, *A Solution to the Ecological Inference Problem*, p.94; Bradley Palmquist, 'Unlocking the Aggregate Data Past - Which Key Fits?,' *Historical Methods* 34, no. 4 (2001): pp.160-161.

[15] J. Morgan Kousser, 'Ecological Inference from Goodman to King,' *Historical Methods* 34, no. 3 (2001): p.108; Laura Irwin Langbein and Allan J. Lichtman, *Ecological Inference*, ed. Eric M. Uslaner, (Beverly Hills and London: Sage Publications, 1978), especially p.12; Salway and Wakefield, *A Comparison of Approaches to Ecological Inference*; Jonathon Wakefield, *Ecological Inference for 2 X 2 Tables: Working Paper No. 12, Center for Statistics and the Social Sciences, University of Washington, Seattle, USA* (2001, accessed 19 September 2002); available from www.csss.washington.edu/Papers/wp12.pdf.

In a set of P electorates, there are P equations, but 2P unknowns to estimate: β_{bj} and β_{wj} for each of the P electorates. The solution is indeterminate without further assumptions. Goodman proposed assuming that the unknown proportions, β_{bj} and β_{wj}, vary only randomly across electorates about means B_b and B_w, so that we have $\beta_{bj} = B_b$ and $\beta_{wj} = B_w$; and that the values of t_j are normally distributed, with the same variance for each x-value. It is then possible to solve for B_b and B_w using least squares regression based on the following equation

$$t_j = (B_b - B_w)\, x_j + B_w$$

The assumption that β_{bj} and β_{wj} vary only randomly across electorates about means B_b and B_w is equivalent to assuming that the proportions of men voting Liberal are much the same in every electorate, and so are the proportions of women voting Liberal; that is that electorate characteristics such as incumbency or rurality make only random difference to gendered behaviour and there is no aggregation bias.[16]

Goodman emphasised that his solution only applied in specific circumstances, those in which the assumptions hold. The assumption that $\beta_{bj} = B_b$ and $\beta_{wj} = B_w$ is often incorrect. In particular, the method does not allow for any systematic differences due to other factors such as rurality. Work on social class, religion, rurality, age and other variables has shown that these factors can cause differences in vote choice.[17] Indeed, it seems obvious that circumstances in particular electorates may influence the way men and women vote there, and interact with gender in influencing voting choices. A number of analysts have suggested that modifications to Goodman's model can make it more widely applicable. In particular, grouping like groups together, and performing separate ecological regressions on sub-sets of the larger data-sets has been successful in a number of trials.[18]

A second disadvantage of Goodman's approach is that it does not take into account the bounds on the internal cells and, as a result, can produce impossible estimates, greater than 100%, or less

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[16] Leo A. Goodman, 'Ecological Regression and the Behavior of Individuals,' *American Sociological Review* 18, no. 6 (1953); Leo A. Goodman, 'Some Alternatives to Ecological Correlation,' *American Journal of Sociology* 64, no. 6 (1959).

[17] See for example Martin Holland, 'Introduction: Understanding Electoral Behaviour,' in *Electoral Behaviour in New Zealand*, ed. Martin Holland, Oxford Readings in New Zealand Politics (Oxford: Oxford University Press, 1992).

[18] For example Kousser, 'Ecological Inference from Goodman to King,' pp.110-115.

than 0%. Moreover, the method can produce estimates that are possible, but do not lie within the known bounds.

Despite these shortcomings, Goodman's regression was, for a long time, the standard approach to ecological inference. A debate in *The Journal of Interdisciplinary History* in the early 1970s delineated the technique for historians, but there was disagreement over how to compensate for the limited application of the technique.[19] New work focussed on identifying when Goodman's ecological regression was appropriate, how aggregation bias affected the estimates, and whether it could be overcome by better specification, that is extending the model by adding other variables, or making other modifications. Modifications have made the approach more flexible, and compensated for some disadvantages of the simple model. [20]

Applying ecological regression to election data from 32 electorates where one Liberal candidate stood in 1893 gives the following solution:

$$t_j = 0.8558\, x_j + 0.1426$$

$$= 0.9984x + 0.1426(1-x_j)$$

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[19] E. Terence Jones, 'Ecological Inference and Electoral Analysis,' *Journal of Interdisciplinary History* 2, no. 3 (1971); E. Terence Jones, 'Using Ecological Regression,' *Journal of Interdisciplinary History* 4, no. 4 (1974); J. Morgan Kousser, 'Ecological Regression and the Analysis of Past Politics,' *Journal of Interdisciplinary History* 4, no. 2 (1973); Allan J. Lichtman, 'Correlation, Regression and the Ecological Fallacy: A Critique,' *Journal of Interdisciplinary History* 4, no. 3 (1974).

[20] Cleave, Brown, and Payne, 'Evaluation of Methods for Ecological Inference.'; John L. Hammond, 'Two Sources of Error in Ecological Correlations,' *American Sociological Review* 38, no. 6 (1973); Jac C. Heckelman, 'Determining Who Voted in Historical Elections: An Aggregated Logit Approach,' *Social Science Research* 26 (1997); Langbein and Lichtman, *Ecological Inference;* Guillermo Owen and Bernard Grofman, 'Estimating the Likelihood of Fallacious Ecological Inference: Linear Ecological Regression in the Presence of Context Effects,' *Political Geography* 16, no. 8 (1997); W. Phillips Shively, '"Ecological" Inference: The Use of Aggregate Data to Study Individuals,' *American Political Science* 63, no. 4 (1969); W. Phillips Shively, 'A General Extension of the Method of Bounds, with Special Application to Studies of Electoral Transition,' *Historical Methods* 24, no. 2 (1991).

The regression line is shown in Figure 4.2. The graph shows an ordinary least squares regression line fitted around the aggregate data points. The fit is poor ($R^2 = 0.14$).[21]. Furthermore, the results are unlikely. The estimates claim that, across the electorates, apparently 99% of women who voted, supported the Liberal candidate in their electorate, and only 14% of men supported the Liberals. The difference seems extraordinarily high. There was no suggestion of such a high differential at the Christchurch election, and results from the 1890 election suggest that men's party preferences were unlikely to have been so polarised. Although there was a clear Liberal victory in 1890, few electorate contests were highly polarised. No winning candidate took near 99% of the votes.[22] Note also that these estimates must be rejected since they fall outside the known bounds in a number of electorates.

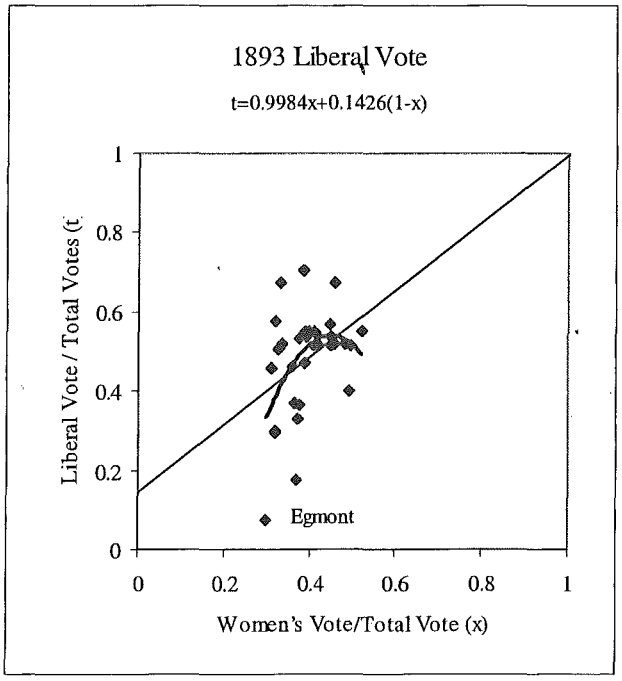

Figure 4.2 Scatter Plot with Goodman Regression Line Shown, Liberal Vote, 1893 (The proportion of all votes cast by women (x_j) appears on the x-axis and the proportion of votes cast for Liberal candidates (t_j) appears on the y-axis.)

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[21] The data might suggest a quadratic pattern, but a quadratic model applied to the data only slightly improved the fit. It gave the equation $y = -9.2958x^2 + 8.3561x - 1.3375$, $R^2 = 0.2057$. The coefficients in a quadratic model do not have the same meaning as those in a linear model.

[22] The results of the 1890 election can be found in the *AJHR*, 1891, H-2.

Lack of variation in the proportion of women in an electorate helps explain why the Goodman estimates for men's and women's voting in 1893 are so far apart. Note that the intersection of the regression line with the y-axis, x = 0, corresponds to the estimate for men's Liberal vote, and its intersection with the line x = 1, on the right of the graph, corresponds to the estimate for women's Liberal vote. Hence the estimates for men's and women's Liberal votes lie at the extreme ends of Figure 4.2, where there are no observations. Both estimates are far from the data-points used to fit the regression line. Extrapolating to the edges of the graph, so far from the data-points used to fit the regression line, is generally not recommended in regression.[23] Simple ecological regression is seldom appropriate for geographical groups of voters classified by gender. Estimation of men's and women's voting using this technique almost always requires extrapolation beyond the interval where the electorate values fall because it is extremely rare to find geographically-based voting groups that are mainly men or mainly women.

In a bigger data-set, splitting the electorates into like sub-groups might be a useful way to proceed. Here the number of data-points is too small to justify this, and the extrapolation problem remains. I did, however, run two different regressions, one for electorates where all residents lived in rural boroughs, and another for the remaining electorates. Neither model fitted well and the estimates remained highly implausible.[24]

Neighbourhood Model

The neighbourhood model was designed to undermine Goodman's technique for ecological inference. Its authors assume that β_{bj} and β_{wj} vary linearly in terms of x_j:

$$\beta_{bj} = a_b + b_b x_j$$

$$\text{and } \beta_{wj} = a_w + b_w x_j,$$

$$\text{for some } a_b, a_w, b_b, b_w$$

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[23] See for example Jerrold H. Zar, *Biostatistical Analysis*, 4 ed. (Upper Saddle River, New Jersey: Prentice Hall, 1999), pp.331-332.

[24] Regression on electorates with 100% of residents residing in a rural electorate gave the model $t_j = 1.1418x_j + 0.0337 = (1.1755-0.0337)\, x_j + 0.0337$, $R^2 = 0.1319$, n=22. Regression on the remaining ten electorates where between 15% and 70% of residents lived in rural boroughs gave this model: $t_j = -0.0645x_j + 0.5613 = (0.6258 - 0.5613)\, x_j + 0.5613$, $R^2 = 0.002$.

When these equations are substituted into the accounting identity, a quadratic is obtained, but again the solution is indeterminate, that is, there is not enough information to solve for the unknowns a_b, a_w, b_b, b_w:

$$t_j = (b_b - b_w)x_j^2 + (b_w + a_b - a_w)x_j + a_w.$$

To overcome this, assume independence, that is, assume $a = a_b = a_w$ and $b = b_b = b_w$, so that

$$t_j = a + b\ x_j = \beta_{bj} = \beta_{wj}.$$

This is equivalent to assuming that the proportion of men voting Liberal is the same as the proportion of women voting Liberal in each electorate or that electorate voting is independent of gender. The neighbourhood model effectively assumes the absence of the relationship it is investigating, and so it is seldom applied to real life applications since its underlying assumptions make little sense.

It does, however, provide an important challenge to the use of ecological inference. Recall the model for Goodman's ecological regression:

$$t_j = (B_b - B_w)\ x_j + B_w.$$

This has the same form as the neighbourhood model with $b = B_b - B_w$ and $a = B_w$. However, the regression coefficients have very different meanings and underlying assumptions. Compare the neighbourhood model assumption of no relationship between gender and voting, $\beta_{bj} = \beta_{wj}$, with Goodman's assumption that $\beta_{bj} = B_b$ and $\beta_{wj} = B_w$ which translates to the assumption that the proportion of men voting Liberal is much the same in every electorate, and the proportion of women voting Liberal is the same in every electorate. As King has argued,

> no information appears to exist in [the] data with which to decide which model one is using when regressing T_i on X_i and $(1-X_i)$. *The answer depends entirely on the assumption and the assumption is empirically unverifiable.*[25]

[25] Italics in original. King, *A Solution to the Ecological Inference Problem*, p.44. See also Kousser, 'Evaluating Ecological Inference: An Introduction,' pp.105-107 and Freedman, Klein, Ostland, and Roberts, '[Book Review] A Solution to the Ecological Inference Problem, G. King.' where the neighbourhood model is defended by its authors.

King's Parametric EI

Recent developments in the field of ecological inference do provide alternatives to ecological regression. A breakthrough came with the publication of Gary King's work, *A Solution to the Ecological Inference Problem*, in 1997. King's innovation was the use of the bounds in combination with an estimation technique, thus eliminating the possibility of impossible estimates. His approach has come to be known as EI (for ecological inference). Although the method is based on regression, the mathematics of the approach is much more complicated than simple regression and owes a lot to computing power, using a maximum likelihood estimation procedure. What the method essentially does, is to combine information from all electorates to get an idea of the overall characteristics of the unknown proportions, utilising some assumptions about the nature of these unknowns to compensate for information loss and to define an overall distribution. Samples are taken from relevant subsets of this distribution and the samples are averaged to provide electorate estimates. Aggregate estimates are made up of the electorate estimates. [26]

King's model is based on the accounting identity. King makes the assumption that β_{bj} and β_{wj} are modelled by a truncated bi-variate normal distribution, conditional on x_j, so that

$$\text{Prob}(\beta_{bj}, \beta_{wj}) = \text{TN}(\beta_{bj}, \beta_{wj} | ß, \Sigma)$$

where TN stands for truncated bivariate normal distribution, truncated to ensure that β_{bj} and β_{wj} fall between 0 and 1. ß is the mean vector of (β_{bj}, β_{wj}),

$$ß = \begin{pmatrix} \pi_{bj} \\ \pi_{wj} \end{pmatrix}$$

where $\pi_{bj} = \text{E}(\beta_{bj})$ and $\pi_{wj} = \text{E}(\beta_{wj})$.

Σ is the variance matrix

$$\Sigma = \begin{pmatrix} \sigma_W^2 & \sigma_{WM} \\ \sigma_{WM} & \sigma_M^2 \end{pmatrix}.$$ [27]

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[26] King, *A Solution to the Ecological Inference Problem*. Good outlines of the method for lay readers can be found in Kousser, 'Ecological Inference from Goodman to King' and Palmquist, 'Unlocking the Aggregate Data Past.'

[27] Note that King's description, which I have followed here, does not distinguish between parameters and proportions. His parametric model is based on the accounting identity so that

Furthermore, it is assumed that the values of t_j are independent after conditioning on x_j, which is equivalent to assuming that the observations are spatially independent. In other words, women's turnout in one electorate should not affect women's turnout in another electorate. β_{bj} and β_{wj} are also assumed to be mean independent of x_j, so that

$$E(\beta_{bj} \mid x_j) = B_b \text{ and } E(\beta_{wj} \mid x_j) = B_w.$$

This is weaker than assuming that they are completely unrelated, but is equivalent to assuming that there is no aggregation bias. This assumption requires, for example, that the proportion of men voting Liberal is uncorrelated with the proportion of women that cast a vote.[28]

The process is in four steps. In the first step, the known information for each unit or electorate, for example the proportion of women and the vote for the Liberal candidate, is used to determine the possible values for, or bounds on β_{oj} and β_{1j}. This step is equivalent to determining the tomography lines and drawing a tomography plot, a graphic which King pioneered.

In the second step, the truncated bi-variate normal distribution is simulated. This distribution effectively distils the information about all electorates into one equation. The means, standard deviations and correlation of the β_{bj} and β_{wj} are simulated in a complex procedure that involves re-parametrisation.[29]

Thirdly, the intersections between the tomography lines and the truncated bi-variate normal distribution are used to generate electorate estimates for the unknowns. King uses a figure to describe this step. In this figure, contour ellipses, a projection of the three dimensional truncated bi-variate normal distribution onto a flat place, are shown over the tomography lines, such as in Figure 4.3 which shows a tomography plot with contour ellipses for 32 electorates where one Liberal candidate stood in 1893. It is known that the true values for each electorate must lie on the

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$$t_j = \pi_{bj} x_j + \pi_{wj}(1 - x_j).$$

The model involves estimating π_{bj} and π_{wj}. If the t_j are normally distributed, then $\pi_b = E(\beta_b)$ and $\pi_W = E(\beta_W)$. King does not directly estimate β_{bj} and β_{wj} as he claims. For further details see Beh and others, 'An Empirical Evaluation of Ecological Inference Techniques: Gender and Turnout at New Zealand Elections, 1893 - 1919.'

[28] King, *A Solution to the Ecological Inference Problem*, especially pp.92-96.

[29] Further details of this step are given in King, *A Solution to the Ecological Inference Problem*, pp.96-119.

relevant tomography line. King's method assumes, in his words, that the true values are 'most likely to lie on that portion of the line passing closest to the center of the truncated bi-variate normal distribution contours estimated from all the lines.'[30] In other words, the true values of β_{bj} and β_{wj} are apparently most likely to lie within the part circles shown on the plot. To determine electorate-specific estimates, samples are drawn from the relevant part of the truncated bi-variate normal distribution. This is the intersection between the truncated bi-variate normal distribution, represented by the contour plots, and the tomography line. These samples are then averaged to produce an estimate of the unknowns for each electorate.

In the final step, the electorate estimates are weighted to produce an estimate for the aggregate parameters.

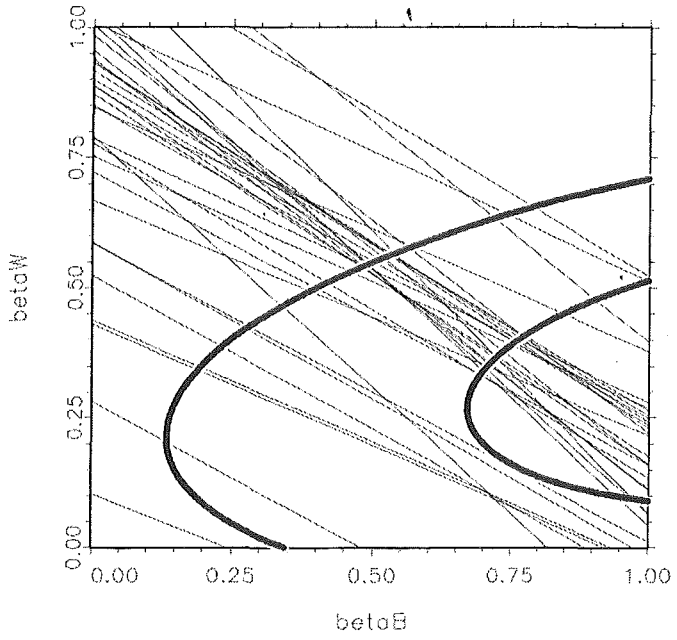

Figure 4.3 Tomography Plot with Contour Ellipses Superimposed for 32 Electorates with One Liberal Candidate, 1893 (Women's Liberal vote (β_{bj}) is shown in the x-axis and Men's Liberal Vote (β_{wj}) is shown on the y-axis.)

King's parametric method for ecological inference can be adapted to take into account extra information through the use of co-variates and the adjustment of model settings. There are a large

[30] King, *A Solution to the Ecological Inference Problem*, 95-96.

number of adjustments that can be made to the model. King claims that such adjustments can effectively relax the assumptions of mean independence and spatial independence. He also makes the stronger claim that, in many cases, the model performs well in the presence of aggregation bias.[31]

King's method has theoretical advantages over previous models. Firstly, it uses all the available information, incorporating the bounds as Goodman's model does not. Secondly, it allows the estimates to vary between electorates, as is intuitively likely, and produces estimates for each electorate as well as for all electorates combined.[32] Extra variables can be included to account for aggregation bias, and the model can be adapted in a number of ways to include extra information from other sources. This flexibility is, however, time-hungry, and requires sufficient knowledge to inform the choice of settings. It can take several runs to produce a good model, and many who have used the software have stuck to the default settings.[33] Practically, EI is easy to implement using the default settings at least. The software is available free and the 'easy' version, EzI, has a windows interface that makes it easier for a non-statistician to use. [34]

Despite these advantages, King's method had received a lot of criticism. King's choice of a truncated bi-variate normal distribution has been questioned. Like assumptions made in other methods for ecological inference, it is seldom testable. Palmquist called the choice of a truncated bi-variate normal distribution King's wager.

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[31] King, *A Solution to the Ecological Inference Problem*, pp.55,94.

[32] Note that electorate-specific estimates can be produced for Goodman's method. See Beh and others, 'An Empirical Evaluation of Ecological Inference Techniques: Gender Turnout in New Zealand, 1893 - 1919.'

[33] See Paul Bourke, Donald DeBats, and Thomas Phelan, 'Comparing Individual-Level Returns with Aggregates,' *Historical Methods* 34, no. 3 (2001): p.132. Voss criticises King's critics, particularly Cho and Freedman, for not utilising the options available in EI. Voss, *Ecological Inference and Contextual Research,* pp.14-15.

[34] King provided two versions of the software. 'EI' is the more powerful of the two, but requires Gauss software, and is command driven. 'EzI' is a stand alone version that runs on Windows, developed by King and Kenneth Benoit. Some options are not available in the easy version, but it is easier to use and EzI is the version used in this thesis. Both versions can be downloaded from Gary King's homepage http://gking.harvard.edu/stats.shtml.

> Are the parameters really distributed in this fashion? It is possible, but there is no strong theoretical justification for favouring this particular distribution over all others.... King's wager is that his distributional assumption will sometimes be a serviceable guess.[35]

It is difficult to quantify how serious this wager is, since any estimation technique must make assumptions to overcome the information loss caused by aggregation. More serious disadvantages include the value of information provided by diagnostics. Most of the diagnostics are graphical and can be difficult to read, making it hard to determine if solutions are reasonable. Moreover, there are doubts over the meaning and precision of the standard errors produced by the King's EI. Wendy Cho claimed that EI produced 'a set of "believable" models which yield an array of "solutions" but no clear way of distinguishing good models from bad models.'[36] Moreover, King's claims that the model performs well in the presence of aggregation bias, despite the assumption of mean independence, have been shown to be overstated. Like any other estimation model, EI depends on the data fed into it, and if this data-set has lost a lot in the aggregation process, or if the data violate the assumptions, the estimates will be poor.[37]

One positive result of King's work was the prompting of further interest in ecological inference. A number of statisticians have suggested new approaches, or adaptations to King's model.[38] Discussion of King's EI is beginning to appear in the historical literature, most notably in an issue of *Historical Methods*, which was devoted to the topic. Data-sets examined included race votes in 1896 North Carolina[39], voter transitions between the 1840 and 1844 presidential elections in

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[35] Palmquist, 'Unlocking the Aggregate Data Past,' p.161.

[36] Cho, *Iff the Assumptions Fit*, p.21.

[37] Cho, *Iff the Assumptions Fit*. See also, Freedman, Klein, Ostland, and Roberts, '[Book Review] a Solution to the Ecological Inference Problem, G. King.'; King, 'The Future of Ecological Inference Research: A Comment on Freedman Et Al. [Letter to the Editor]' and Freedman and others, 'Response to King's Comment [Letter to the Editor].'

[38] See for example Jeffrey B. Lewis, 'Understanding King's Ecological Inference Model: A Method-of-Moments Approach,' *Historical Methods* 34, no. 4 (2001); Wakefield, *Ecological Inference for 2 X 2 Tables: Working Paper No. 12, Center for Statistics and the Social Sciences, University of Washington, Seattle, USA*; Jonathon Wakefield and Ruth Salway, 'A Statistical Framework for Ecological and Aggregate Studies,' *Journal of the Royal Statistical Society Series A (Statistics in Society)* 164, no. 1 (2001).King himself has provided an adjusted model. Ori Rosen and others, 'Bayesian and Frequentist Inference for Ecological Inference: The R X C Case,' *Statistica Neerlandica* 55, no. 2 (2001).

[39] Kousser, 'Evaluating Ecological Inference: An Introduction.'

Illinois[40] and black and white turnout in eleven American southern states.[41] Robinson's data on 1910 American literacy rates was also re-examined.[42] Many of the articles concluded that the estimates created by traditional ecological regression were just as good, or better than those produced by EI. [43]

King's Non-Parametric EI

King also developed what he called a non-parametric approach. King suggested this method is most appropriate when the data indicate the truncated bi-variate normal distribution assumption does not hold. If there is an indication of multiple modes or outliers, then the non-parametric method may be appropriate since these characteristics can be picked up by a non-parametric analysis. The primary use of the non-parametric method by King is as a diagnostic to test the appropriateness of the truncated bi-variate normal distribution assumption. The basis of the non-parametric method is much less fully developed by King than that of the parametric method.[44]

Instead of using the global assumption of a truncated bi-variate normal distribution, King assumes local smoothing, with the amount of smoothing equivalent to how much strength is borrowed between electorates. Using kernel density estimation, electorate estimates are produced by giving 'higher probability to those points on each tomography line that pass closest to portions of other lines.'[45]

At any point (β_{b^*}, β_{w^*}), the value of the non-parametric density estimate is

$$f(\beta_{b^*}, \beta_{w^*}) = \frac{1}{\sqrt{2\pi P}} \sum_{j=1}^{P} \exp\left(-\frac{1}{2hc_j} d_j^2 \right)$$

where h is a smoothing parameter

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[40] Bourke, DeBats, and Phelan, 'Comparing Individual-Level Returns with Aggregates.'

[41] Kent Redding and David R. James, 'Estimating Levels and Modeling Determinants of Black and White Voter Turnout in the South, 1880-1912,' *Historical Methods* 34, no. 4 (2001).

[42] Palmquist, 'Unlocking the Aggregate Data Past.'

[43] Bourke, DeBats, and Phelan, 'Comparing Individual-Level Returns with Aggregates.'; Kousser, 'Evaluating Ecological Inference: An Introduction.'; Palmquist, 'Unlocking the Aggregate Data Past.'

[44] King, *A Solution to the Ecological Inference Problem*, pp.191-196,309-310.

[45] King, *A Solution to the Ecological Inference Problem*, p.192.

d_j is the perpendicular distance between the overall proportion and the tomography line for the j'th electorate;

c_j is the area under the untruncated bi-variate distribution

and P is the number of electorates.

Estimates of the unknown electorate proportions are calculated by sampling from relevant parts of the nonparametric posterior distribution. [46]

The assumptions of no aggregation bias and spatial independence still hold for King's non-parametric method, but its advantage is that it can be used when electorates have less in common and when it is intuitively plausible to borrow most strength from similar electorates, rather than from all electorates. However, the parametric method generally provides narrower confidence intervals and King suggests that his parametric method is better at picking up positive correlations between β_{bj} and β_{wj}.[47] The non-parametric method has received very little attention in the literature, and few empirical trials are available.[48]

A number of other developments in the field of ecological inference have also been largely ignored by analysts. A group of survey statisticians published a number of articles on aggregate data at the same time as King's book was published, prompted by aggregation issues in census data. Early articles concentrated on understanding how aggregation affected basic statistics like means and variance and how to choose extra variables to adjust for the bias caused by aggregation.[49] More recent work details new methods for estimating unknown parameters. I review two here.

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[46] King, *A Solution to the Ecological Inference Problem*, pp.191-196,309-310.

[47] King, *A Solution to the Ecological Inference Problem*, pp.195-196,285.

[48] Cho notes that the non-parametric method did not produce reliable estimates in her trials, but concentrates on King's parametric method. Cho, *Iff the Assumptions Fit*, p.20.

[49] D. Holt, D. G. Steel, M. Tranmer, and N. Wrigley, 'Aggregation and Ecological Effects in Geographically Based Data,' *Geographical Analyis* 28, no. 3 (1996); D. G. Steel and D. Holt, 'Analysing and Adjusting Aggregation Effects: The Ecological Fallacy Revisited,' *International Statistical Review* 64, no. 1 (1996); D. G. Steel and D. Holt, 'Rules for Random Aggregation,' *Environment and Planning A* 28 (1996); D. G. Steel, D. Holt, and M. Tranmer, 'Making Unit-Level Inferences from Aggregate Data,' *Survey Methodology* 22, no. 1 (1996); D. G. Steel, M. Tranmer, and D. Holt, *Logistic Regression Analysis*

Semi-Parametric Approach

Chambers and Steel have suggested a semi-parametric approach that builds on the neighbourhood model.[50] Chambers and Steel suggested that instead of assuming independence, proportionality might be assumed. In other words, assume

$$\beta_{bj} = \gamma\, t_j,$$

where γ is some positive constant. If $\gamma = 1$, this is the neighbourhood model. Chambers and Steel then apply the known bounds on β_{bj} and β_{wj} to place limits on the value of γ:

$$max(0, \frac{1}{t_j} + \frac{1}{x_j} - \frac{1}{x_j t_j}) = \gamma_{Lj} \leq \gamma \leq \gamma_{Uj} = min(\frac{1}{t_j}, \frac{1}{x_j})$$

Assuming that γ comes from a random, uniform distribution, γ can be estimated by the midpoint of the upper and lower bounds:

$$\hat{\gamma} = \frac{\gamma_U + \gamma_L}{2},$$

and thus β_{bj} and β_{wj} are estimated by:

$$\hat{\beta}_{bj} = \hat{\gamma} t_j,$$

$$\hat{\beta}_{wj} = \frac{t_j(1 - \hat{\gamma} x_j)}{1 - x_j}$$

Replacing the maximum and minimum in the bounds equations for γ by quantiles allows extreme values to be omitted, and γ is then given by:

$$quantile_{1-\alpha}(\gamma_{Lj}) = \gamma_L(\alpha) \leq \gamma \leq \gamma_U(\alpha) = quantile_{\alpha}(\theta_{Uj}),$$

so that

$$\hat{\gamma}(\alpha) = \frac{\gamma_U(\alpha) + \gamma_L(\alpha)}{2}.$$

The value of α, $0 < \alpha < 1$, determines what proportion of the extreme values are excluded.[51]

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with Aggregate Data: Tackling the Ecological Fallacy (1997, accessed 5 May 2003); available from www.am.stat.org/sections/srms/Proceedings/papers/1997-054.pdf; M. Tranmer and D. G. Steel, 'Using Census Data to Investigate the Causes of the Ecological Fallacy,' *Environment and Planning A* 30 (1998).

[50] Chambers and Steel, 'Simple Methods for Ecological Inference in 2x2 Tables.'

[51] Note if $\alpha = 0.25$, the quantiles are equivalent to quartiles.

The model also allows for the inclusion of co-variates either by stratification, that is dividing the data into like sub-groups, or by modifying the equations for $\hat{\gamma}$.

The appropriateness of this method depends on the applicability of the assumptions. The assumption of linearity may be reasonable in a number of cases, but the assumption of uniformity is quite strong, and if this fails, then the method will not provide accurate estimates. This method has not been reviewed or trialled in the literature. However, its simplicity is appealing, and it deserves further trials.

Homogeneous

Most recently, Steel, Beh and Chambers have developed yet another approach. This is perhaps the first attempt made by statisticians, rather than social scientists, to solve the ecological inference problem. It uses convoluted binomial probabilities and maximum likelihood estimation to estimate the unknowns.[52] Since this method has been only recently proposed, it is more thoroughly reviewed here.

Recall the contingency table given in Table 4.1, and generalised below in Table 4.7. In an election where P electorates were contested, there are P such tables, and P sets of known marginals. For each electorate we have the individual data $d_j^{(1)} = \{v_{flj}, v_{foj}, v_{mlj}, v_{moj}\}$, which is unknown, and the aggregate data $d_j^{(2)} = \{v_{fj}, v_{lj}, n_j\}$ which is known.

Table 4.7 Party Voting in Electorate j, 1893

1893	Y=L	Y=O	Total
X=F	V_{flj} β_{bj}	V_{foj} $1-\beta_{bj}$	V_{fj} X_j
X=M	V_{mlj} β_{wj}	V_{moj} $1-\beta_{wj}$	V_{mj}
Total	V_{jl} t_j	V_{oj}	n_j

[52] Steel, Beh, and Chambers, 'The Information in Aggregate Data.'

The authors begin by assuming that, for each electorate, the marginal frequencies for gender are fixed and that party vote is independent given gender. Hence we have the binomial distributions

$$v_{flj} \sim \text{Binomial}\,(v_{fj}, \pi_{bj}) \text{ and } v_{mlj} \sim \text{Binomial}\,(v_{mj}, \pi_{wj})$$

where π_{bj} = Prob(Y=L | X=F) and π_{wj} = Prob (Y=L | X=M) for electorate j. $\pi_{bj} = E(\beta_{bj})$ and $\pi_{wj} = E(\beta_{wj})$.

The odds ratio is given by

$$\theta_j = \frac{\pi_{bj}}{(1-\pi_{bj})} \frac{(1-\pi_{wj})}{\pi_{wj}}$$

Consider the individual data. The likelihood for $\{\pi_{bj}, \pi_{wj}\}$ based on $d_j^{(1)}$ is $L_j^{(1)}(\pi_{bj}, \pi_{wj}; d_j^{(1)})$ and the log-likelihood is given by

$$l^{(1)}(\pi_{bj}, \pi_{wj}; d_j^{(1)}) = l_j^{(1)} = v_{flj} \log \pi_{bj} + n_{foj} \log(1-\pi_{bj}) + \mathrm{n_{mlj}} \log \pi_{wj} + n_{moj} \log(1-\pi_{wj})$$

We also have the individual level score function

$$sc^{(1)}(\pi_{bj}, \pi_{wj}; d_j^{(1)}) = \begin{bmatrix} \dfrac{v_{flj} - v_{fj}\pi_{bj}}{\pi_{bj}(1-\pi_{bj})} \\ \dfrac{v_{lj} - v_{flj} - n_{mj}\pi wj}{\pi_{wj}(1-\pi_{wj})} \end{bmatrix}$$

Setting the score function to 0 and solving the resultant equations gives the maximum likelihood estimates which are:

$$(\hat{\pi}_{bj}, \hat{\pi}_{wj}) = \left(\frac{v_{flj}}{v_{fj}}, \frac{v_{mlj}}{v_{mj}}\right), \text{ that is } (\hat{\pi}_{bj}, \hat{\pi}_{wj}) = (\beta_{bj}, \beta_{wj}).$$

The observed information matrix is

$$\text{info}^{(1)}\left(\pi_{bj},\pi_{wj};d_j^{(1)}\right)=\begin{bmatrix}\dfrac{v_{flj}\left(1-2\pi_{bj}\right)+v_{fj}\pi_{bj}^2}{\pi_{bj}^2\left(1-\pi_{bj}^2\right)} & 0\\ 0 & \dfrac{\left(v_{lj}-v_{flj}\right)\left(1-2\pi_{wj}\right)+v_{mj}\pi_{wj}^2}{\pi_{wj}^2\left(1-\pi_{wj}^2\right)}\end{bmatrix}$$

This is the expected value of the second order derivative of the likelihood function.

However, the individual level data, $d_j^{(1)}$, is not available. Only the aggregate data, $d_j^{(2)}$, is available for each electorate. Analysing each group separately, using the aggregate data, we have the score function

$$sc^{(2)}\left(\pi_{bj},\pi_{wj};d_j^{(2)}\right)=E\left[sc^{(1)}\left(\pi_{bj},\pi_{wj};d_j^{(1)}\right)\middle|\, d_j^{(2)}\right]=\begin{bmatrix}\dfrac{E\left(v_{flj}\mid d_j^{(2)}\right)-v_{fj}\pi_{bj}}{\pi_{bj}\left(1-\pi_{bj}\right)}\\ \dfrac{v_{lj}-E\left(v_{flj}\mid d_j^{(2)}\right)-v_{mj}\pi_{wj}}{\pi_{wj}\left(1-\pi_{wj}\right)}\end{bmatrix}$$

Setting this to 0, and solving the resultant equations to obtain the maximum likelihood estimates for π_{bj} and π_{wj} gives the relationship

$$\pi_{bj}=\frac{v_{lj}}{v_{mj}}-\frac{v_{fj}}{v_{mj}}\pi_{wj}=\frac{t_j}{1-x_j}-\frac{x_j}{1-x_j}\pi_{wj}$$

which corresponds to the tomography line. That is, given the aggregate data, the most likely values for the unknown probabilities lie on the tomography line.

In order to evaluate the aggregate score function for each electorate, we need to evaluate $E\left(v_{flj}\mid d_j^{(2)}\right)$. Conditional on $d_j^{(2)}$, v_{flj} has a non-central hypergeometric distribution and we have the expected cell frequencies

$$E\left(v_{flj}\mid d_j^{(2)}\right)=\frac{P_1\left(\theta_j;d_j^{(2)}\right)}{P_0\left(\theta_j;d_j^{(2)}\right)}=\kappa_1\left(\theta_j;d_j^{(2)}\right)$$

with

$$Var\left(v_{fij} \mid d_j^{(2)}\right) = \frac{P_2\left(\theta_j; d_j^{(2)}\right)}{P_0\left(\theta_j; d_j^{(2)}\right)} - \kappa_1\left(\theta_j; d_j^{(2)}\right)^2 = \kappa_2\left(\theta_j; d_j^{(2)}\right)$$

where

$$P_r\left(\theta_j; d_j^{(2)}\right) = \sum_{i=a_j}^{b_j} \binom{v_{fj}}{i} \binom{v_{mj}}{v_{lj} - i} i^r \theta_j^i$$

and $a_j = \max(v_{lj} - v_{mj}, 0)$ and $b_j = \min(v_{fj}, v_{lj})$.

We also have the aggregate information matrix

$$\text{info}^{(2)}\left(\pi_{bj}, \pi_{wj}; d_j^{(2)}\right) = E\left[\text{info}^{(1)}\left(\pi_{bj}, \pi_{wj}; d_j^{(1)}\right) \mid d_j^{(2)}\right] - Var\left[sc^{(1)}\left(\pi_{bj}, \pi_{wj}; d_j^{(1)}\right) \mid d_j^{(2)}\right]$$

where

$$E\left[\text{info}^{(1)}\left(\pi_{bj}, \pi_{wj}; d_j^{(1)}\right) \mid d_j^{(2)}\right] = \begin{bmatrix} \frac{\left(1 - 2\pi_{bj}\right)\kappa_1\left(\theta_j \mid d_j^{(2)}\right) + v_{fj}\pi_{bj}^2}{\pi_{bj}^2\left(1 - \pi_{bj}^2\right)} & 0 \\ 0 & \frac{\left(v_{lj} - \kappa_1\left(\theta_j \mid d_j^{(2)}\right)\right)\left(1 - 2\pi_{wj}\right) + v_{mj}\pi_{wj}^2}{\pi_{wj}^2\left(1 - \pi_{wj}^2\right)} \end{bmatrix}$$

and

$$Var\left[sc^{(1)}\left(\pi_{bj}, \pi_{wj}; d_j^{(1)}\right) \mid d_j^{(2)}\right] = \kappa_2\left(\theta_j; d_j^{(2)}\right) \begin{pmatrix} \frac{1}{\pi_{nj}^2\left(1 - \pi_{bj}\right)^2} & \frac{-1}{\pi_{bj}\pi_{wj}\left(1 - \pi_{bj}\right)\left(1 - \pi_{wj}\right)} \\ \frac{-1}{\pi_{bj}\pi_{wj}\left(1 - \pi_{bj}\right)\left(1 - \pi_{wj}\right)} & \frac{1}{\pi_{wj}^2\left(1 - \pi_{wj}\right)^2} \end{pmatrix}$$

The aggregate likelihood is

$$L(\pi_{bj}, \pi_{wj} \mid d_j) = \sum_{k=a_j}^{b_j} \binom{v_{fj}}{k} \binom{v_{mj}}{v_{lj} - k} \pi_{bj}{}^k \left(1 - \pi_{bj}\right)^{v_{fj} - k} \pi_{wj}{}^{v_{lj} - k} \left(1 - \pi_{wj}\right)^{v_{mj} - v_{lj} + k}$$

The maximum likelihood estimates derived from the score function are the tomography lines. However, in a set of P groups there are P tomography lines, P observations and 2P parameters. For each group there is only one observed random variable, v_{fj}, and two parameters. Hence, we cannot solve the equations unless further assumptions are made.

Steel et al. suggest assuming that $\pi_{bj} = \pi_b$ and $\pi_{wj} = \pi_w$, for some π_b and π_w, that is assuming homogeneity, to overcome the problem of lack of new information in the maximum

likelihood estimates. This is a very strong assumption and it is more likely that π_{bj} and π_{wj} vary across electorates. Note that although this assumption appears very similar to the assumption made in Goodman's ecological regression, it is less restrictive, since it assumes homogeneity of the underlying parameters, not the observed proportions. Ecological regression also requires that the marginal proportion t_j is normally distributed. Moreover, Goodman's approach does not take into account the known bounds which are satisfied in this method. The homogeneity assumption is also equivalent to King's assumption of mean independence, but it is not accompanied by the other assumptions made by King.

When $\pi_{bj} = \pi_b$ and $\pi_{wj} = \pi_w$, the score matrix is

$$sc^{(2)}\left(\pi_b, \pi_w; d_j^{(2)}\right) = \begin{bmatrix} \dfrac{\sum_j \kappa_1\left(\theta \mid d_j^{(2)}\right) - v_f \pi_b}{\pi_b(1-\pi_b)} \\ \dfrac{v_l - \sum_j \kappa_1\left(\theta \mid d_j^{(2)}\right) - n_m \pi_w}{\pi_w(1-\pi_w)} \end{bmatrix}$$

Setting this to 0 gives the overall tomography line

$$\pi_w = \frac{v_l}{v_m} - \frac{v_f}{v_m}\pi_b$$

$$= \frac{t}{1-x} - \frac{x}{1-x}\pi_b$$

When $\pi_{bj} = \pi_b$ and $\pi_{wj} = \pi_w$, we also have the information matrix with terms

$$\text{info}_{11}^{(2)}\left(\pi_b, \pi_w; d_j^{(2)}\right) = \frac{(1-2\pi_b)\sum_j \kappa_1\left(\theta; d_j^{(2)}\right) + \pi_b^2 v_f - \sum_j \kappa_2\left(\theta; d_j^{(2)}\right)}{\pi_1^2(1-\pi_1)^2}$$

$$\text{info}_{12}^{(2)}\left(\pi_b, \pi_w; d_j^{(2)}\right) = \text{info}_{21}^{(2)}\left(\pi_b, \pi_w; d_j^{(2)}\right) = \frac{\sum_j \kappa_2\left(\theta; d_j^{(2)}\right)}{\pi_b \pi_w (1-\pi_b)(1-\pi_w)}$$

$$\text{info}_{22}^{(2)}\left(\pi_b, \pi_w; d_j^{(2)}\right) = \frac{(1-2\pi_w)\left(v_l - \sum_j \kappa_1\left(\theta; d_j^{(2)}\right)\right) + \pi_w^2 v_m - \sum_j \kappa_2\left(\theta; d_j^{(2)}\right)}{\pi_w^2(1-\pi_w)^2}$$

and

$$se\left(\hat{\pi}_b \mid d_j^{(2)}\right) = \frac{1}{\sqrt{\text{info}_{11}^{(2)}\left(\hat{\pi}_b, \hat{\pi}_w \mid d_j^{(2)}\right)}}$$

$$se\left(\hat{\pi}_w \mid d_j^{(2)}\right) = \frac{1}{\sqrt{\text{info}_{22}^{(2)}\left(\hat{\pi}_b, \hat{\pi}_w \mid d_j^{(2)}\right)}}$$

The equations $sc^{(2)}\left(\pi_b, \pi_w; d_j^{(2)}\right) = 0$ can be solved to obtain the estimates $\hat{\pi}_b$ and $\hat{\pi}_w$, assuming homogeneity. This can be done using the Newton-Raphson iterative procedure.[53]

Estimates of the electorate specific proportions $\beta_{bj} = \frac{v_{fbj}}{v_{fj}}$ and $\beta_{mj} = \frac{v_{mlj}}{v_{mj}}$ are given by

$$\hat{\beta}_{bj} = \frac{\kappa_1\left(\hat{\theta}; d_j^{(2)}\right)}{v_{fj}}$$

and

$$\hat{\beta}_{wj} = \frac{v_{lj} - \kappa_1\left(\hat{\theta}; d_j^{(2)}\right)}{v_{mj}}.$$

Finally, the hypothesis of homogeneity can be tested by comparing the individual level score statistic with the aggregate level score statistic.

$$\begin{aligned} ST^{(1)} &= \sum_j sc^{(1)}\left(\hat{\pi}_b, \hat{\pi}_w; d_j^{(1)}\right)^T \left[\text{info}^{(1)}\left(\hat{\pi}_b, \hat{\pi}_w; d_j^{(1)}\right)\right]^{-1} sc^{(1)}\left(\hat{\pi}_b, \hat{\pi}_w; d_j^{(1)}\right) \\ &= \sum_j ST_j^{(1)} \\ ST^{(2)} &= \sum_j sc^{(2)}\left(\hat{\pi}_b, \hat{\pi}_w; d_j^{(2)}\right)^T \left[\text{info}^{(2)}\left(\hat{\pi}_b, \hat{\pi}_w; d_j^{(2)}\right)\right]^{-1} sc^{(2)}\left(\hat{\pi}_b, \hat{\pi}_w; d_j^{(2)}\right) \\ &= \sum_j ST_j^{(2)} \end{aligned}$$

Since aggregation causes a loss of information, the aggregate score statistic $ST^{(2)}$ will be less than or equal to the individual score statistics, that is $ST^{(2)} \leq ST^{(1)}$.

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[53] For further details of this procedure see Steel, Beh, and Chambers, 'The Information in Aggregate Data.'

This method has been so recently proposed, that it has not been evaluated by other researchers, and the performance of the approach in the face of aggregation bias has not yet been discussed, although Steel and his co-authors are currently working on variations of the basic model. The basic model provides an advance on previous methods in a number of ways. In the first case, it satisfies the bounds, not by constraint, as King's method does, but as a result of the assumptions, since the maximum likelihood estimates correspond to the tomography line. Secondly, the method allows the testing of the assumption of homogeneity. This test allows the identification of electorates where the homogeneity assumption is broken. A disadvantage of the method for historians is that software to implement the method is not yet available, and the complex mathematics makes it difficult for a non-statistician to implement.

Other Methods

Other methods used in the literature include Thomsen's ecological logit model and an Aggregated Compound Multinomial Model (ACM). Since the development of King's EI, these methods have been largely ignored. The ACM approach is quite difficult to implement, so I do not review it here. Thomsen's approach is also excluded because other trials have not found it to perform particularly well, and it does not satisfy the known bounds.[54]

Previous analysts of New Zealand election history have not noted the problem of the ecological fallacy, but have largely avoided it by looking at voting patterns of entire electorates. Most historians have generally followed Robert Chapman, by stratifying electorates on the basis of the rural population proportion, and tracking the votes of like electorates. These analyses are based on sectional voting, so that they largely avoid the ecological fallacy by discussing not individual votes, but the votes of electorates of a specific character.[55] This approach is not viable for an

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[54] Cleave, Brown, and Payne, 'Evaluation of Methods for Ecological Inference.'; King, *A Solution to the Ecological Inference Problem*, p.121-122; Soren Risbjerg Thomsen, *Issue Voting and Ecological Inference* (2000, accessed 2 December 2002); available from www.ps.au.dk/srt/Ecology.htm; Soren Risbjerg Thomsen, *Ecological Analysis: Technical Course Notes, Essex Summer School in Social Science Data Analysis and Collection* (2002, accessed 4 December 2002); available from www.ps.au.dk/srt/courses.htm.

[55] R. M. Chapman, W. K. Jackson, and A. V. Mitchell, eds., *New Zealand Politics in Action: The 1960 General Election* (London: Oxford University Press, 1962); Robert M. Chapman, 'The Significance of the 1928 General Election: A Study in Certain Trends in New Zealand Politics in the Nineteen-Twenties' (MA Thesis, University of Auckland, 1948); Robert M. Chapman, 'The General Result,' in *New Zealand Politics*

analysis based on gender because, as shown in Table 4.6, there was very little variation in the gender proportion of the voting population. In other words, all electorates are similar when it comes to the gender balance of the population. Dividing electorates into those with more or less women or men makes little sense here.

A number of authors have noted the difficulties inherent in using methods for ecological inference on data classified by gender. Voss suggested that 'gender differences in voting will never be open to aggregate-data analysis.'[56] However, King successfully applied the method to data classified by gender and poverty status.[57] Kevin Corder and Christina Wolbrecht have also applied the model, with some adaptations, to United States data on gender and voting rates. Corder and Wolbrecht faced the presence of aggregation bias and a limited amount of variation in the gender balance of the voting population,[58] problems which are present in the New Zealand data on gender and voting.

Checking for Aggregation Bias

Most methods for ecological inference perform poorly in the presence of aggregation bias, so checking the aggregate data for evidence of aggregation bias is a crucial prologue to performing

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in Action: The 1960 General Election, ed. R. M. Chapman, W. K. Jackson, and A. V. Mitchell (London: Oxford University Press, 1962); Robert M. Chapman, 'The Response to Labour and the Question of Parallelism of Opinion, 1928-60,' in *New Zealand Politics and the Social Pattern: Selected Works by Robert Chapman*, ed. Elizabeth McLeay (Wellington: Victoria University Press, 1999); Leslie Lipson, *The Politics of Equality: New Zealand's Adventures in Democracy* (Chicago: University of Chicago Press, 1948); R. K. Newman, 'Liberal Policy and the Left Wing 1908-1911: A Study of Middle-Class Radicalism in New Zealand' (MA Thesis, University of Auckland, 1965); Richard Newman, 'New Zealand's Vote for Prohibition in 1911,' *New Zealand Journal of History* 9, no. 1 (1975). Jurgen Falter utilised a similar approach that he called 'contrast group analysis' in an examination of voting in Weimar Germany. Jürgen W. Falter, 'How Likely Were Workers to Vote for the NSDAP?,' in *The Rise of National Socialism and the Working Classes in Weimar Germany*, ed., Conan Fischer (Providence: Bergahn Books, 1996).

[56] Palmquist, 'Unlocking the Aggregate Data Past,' p.167; Voss, *Ecological Inference and Contextual Research*, p.12.

[57] King, *A Solution to the Ecological Inference Problem*, pp.217-225.

[58] Corder and Wolbrecht, *Participation by New Voters*; Corder and Wolbrecht, *Women's Turnout after Suffrage*; Corder and Wolbrecht, *Using Prior Information to Aid Ecological Inference*; Wolbrecht and Corder, *Gender and the Vote*.

ecological inference. A number of attempts have been made to quantify aggregation bias,[59] but there is no consensus on how to deal with the problem. One measure of aggregation bias is the Palmquist inflation factor. This measures the loss of variation in the independent variables, x_j, the proportion of votes cast by women, and is given by

$$F = \frac{1}{\eta^2} - 1,$$

$$\text{where } \eta^2 = \frac{\left(\sum_{j=1}^{P} \frac{n_j x_j^2}{n} - \bar{x}^2 \right)}{\bar{x} - \bar{x}^2},$$

$$n = \sum_{j=1}^{P} n_j \text{ and } \bar{x} = \frac{\sum_{j=1}^{P} n_j x_j}{n}.$$

A high inflation factor indicates that the data is substantially more sensitive to grouping effects. Palmquist suggests that an inflation factor under three gives a good chance of making reasonable inferences in regression based models. In the case of data classified by gender, the inflation factor is often extremely high, reflecting the fact that such data is extremely sensitive to aggregation bias.[60]

A second way of checking for aggregation bias is to check for the presence contextual or confounding variables. King promotes the use of graphical tests, including the examination of the distribution of the known electorate bounds. Scatter plots can also indicate the presence of contextual variables. King suggests that t_j can be used as a surrogate for the unknown values, β_{bj} and β_{wj}, prior to running models.[61] Scatter plots of t_j against potential contextual variables provide useful indications of whether a variable may be related to the unknowns. If a variable, such as the rural population proportion, is related to the Liberal vote, it is likely to be also related to men's

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[59] For example Holt, Steel, Tranmer, and Wrigley, 'Aggregation and Ecological Effects in Geographically Based Data.'; Palmquist, 'Unlocking the Aggregate Data Past,' p.167 and Appendix; Steel, Beh, and Chambers, 'The Information in Aggregate Data.'

[60] King, *A Solution to the Ecological Inference Problem*, pp.45-46, 52-53; Palmquist, 'Unlocking the Aggregate Data Past .' Note that the definition of the inflation factor changes with the nature of the model. The formula given here is for an ecological regression with one independent variable and an intercept.

[61] King, *A Solution to the Ecological Inference Problem*, p.173.

and women's Liberal vote. However, in many cases, there are no data available that measures potential co-variates, in which case they can neither be ruled out, nor included in a model.

A final test for aggregation bias can be made after a model is run. If mean independence holds, there is no aggregation bias. Evidence of a relationship between electorate estimates produced by a method, $\hat{\beta}_{bj}$ and $\hat{\beta}_{wj}$, and the independent variable, x_j, indicates that mean independence does not hold, and thus the estimates may be biased. Plots of the estimates against x_j, made after the model is run, can reveal such a relationship.

1893 Data on Liberal Voting

Consider 32 electorates with one Liberal candidate in 1893. Before proceeding to apply techniques for ecological inference, it is necessary to check the suitability of the data. The two main questions are: How much information was lost in the process of aggregation? Is there evidence of aggregation bias? Examining a number of different relationships graphically suggests that there is little evidence of aggregation bias. However, the data-set does not provide an ideal case for ecological inference since the bounds on men's and women's Liberal vote proportions are wide, indicating that little information about men's and women's voting preferences remains in the data..

The 32 electorates make a varied group, although Liberal candidates won most of them, taking 22 of the seats. Eleven electorates had more than two candidates, but the remainder had two way contests. No urban seats are included since the four urban electorates all had more than one Liberal candidate, and in any case, operated under a different electoral system, with each voter able to cast up to three votes. The rural-urban composition of the electorates ranged from that of Napier, with only 16% living in rural areas, to electorates where all residents were classified rural. There were 22 fully rural electorates amongst the thirty two. Six of the electorates experienced population shrinkage between 1890 and 1896. The rest had experienced population growth.

At 69.5, the Palmquist inflation factor is very high for these electorates, reflecting the lack of variation in the x-variable, which is the proportion of women amongst those that cast a vote. This suggests that estimates will be extremely sensitive to grouping effects. The degree of information loss is also reflected in the wide bounds, revealed in the tomography plot in Figure 4.1. The

bounds are graphed in Figure 4.4 and Figure 4.5. Figure 4.4 shows the bounds on women's votes for the Liberal candidate against the x-variable, x_j. The unknown proportion of women who supported Liberal candidates, β_{bj}, must lie somewhere on each bounds line. The bounds are very wide, except for one electorate, Egmont, on the far left of the graph, where only 30% votes were cast by women, and the Liberal candidate received less than 10% of the vote. Egmont also shows up as an outlier in Figure 4.5, which shows the bounds for men's Liberal votes. The bounds lines are shorter than those in the previous graph, reflecting the fact that, in this particular data-set, the marginal frequencies place greater constraints on men's voting than on women's voting. Overall, the bounds show no particular pattern, and tell us little about men's and women's Liberal voting.[62]

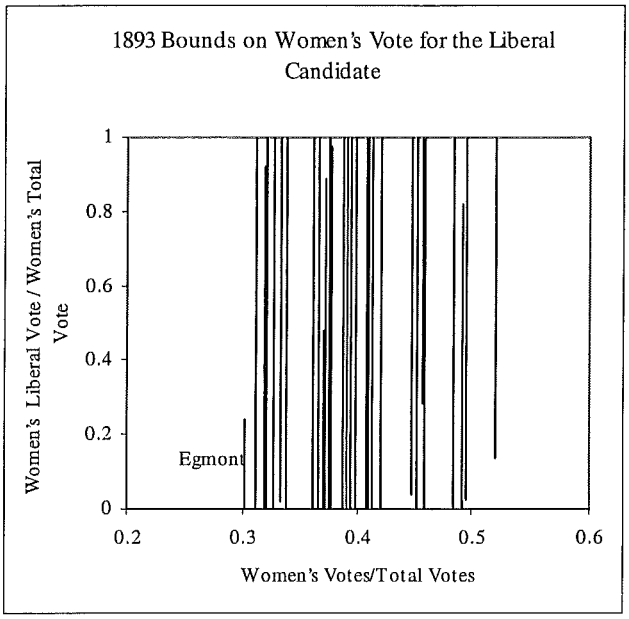

Figure 4.4 Bounds on Women's Vote for the Liberal Candidate in 32 Electorates, 1893

The relationship between the overall Liberal vote and the x-variable is shown in Figure 4.6, which provides some evidence of aggregation bias. The variation in the electorate vote for the Liberal candidate is not independent of the x-variable. It is higher in places where fewer women voted. Where less than 40% of the vote was cast by women the vote for the Liberal candidate varied between under 10% and over 70%. When over 40% of the votes were cast by women, the Liberal

[62] Note that I do not present graphs of the bounds against other factors here. Such graphs can be revealing, but in this case, the bounds are too wide to reveal much of a pattern.

vote varied much less, between 40% and 70%. The variability is largely due to two outliers that appear on the graph: Egmont, where few women voted, and Wairarapa, where the Liberal candidate received few votes. Excluding these outliers may improve the estimates. The electorate of Riccarton is also shown on Figure 4.6.

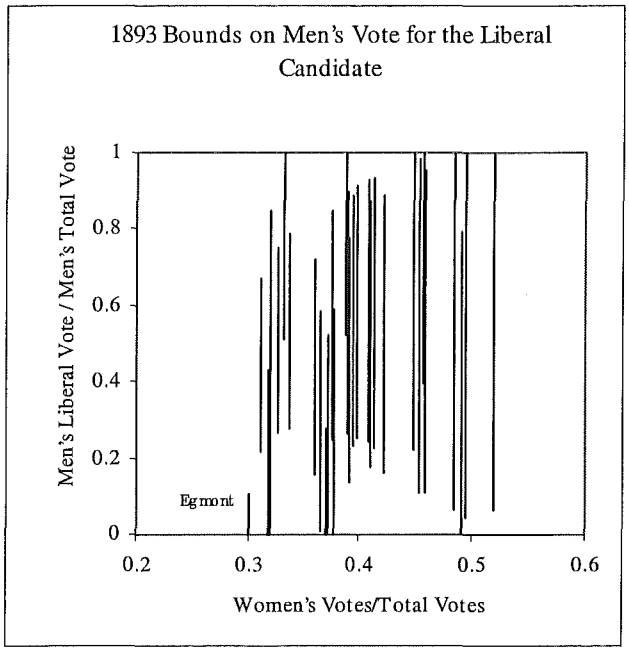

Figure 4.5 Bounds on Men's Vote for the Liberal Candidate in 32 Electorates in 1893

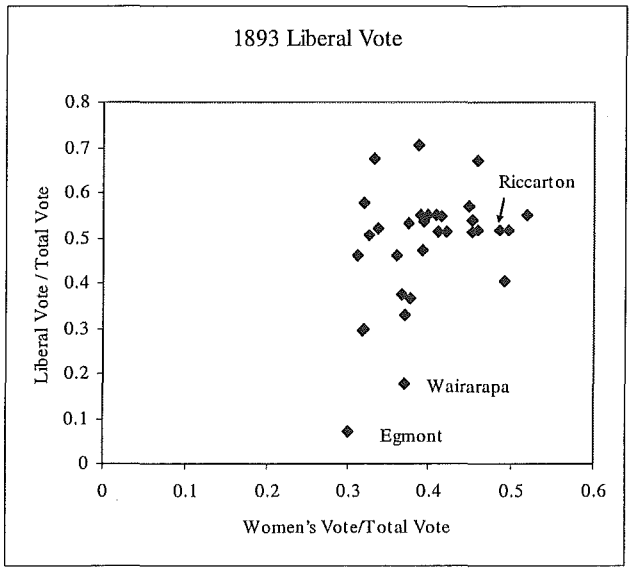

Figure 4.6 Proportion of Votes cast by Women (x_j) and Proportion of Votes for Liberal Candidates (t_j) in 32 Electorates, 1893

Work by other historians suggests other potential confounding variables. David Hamer argued that urban areas were more likely to support Liberals from the 1890s.[63] Gender differences in the Liberal support might also be affected by rural or urban location. Urban areas generally had a higher proportion of women in the population, while back-country areas with a highly mobile population had less women.[64]

Fortunately it is possible to measure both rural population proportion and the mobility of the population. Consider the variables used in Chapter 4:

$$\textit{Rural population proportion} = \frac{\textit{Rural population}}{\textit{Rural + Urban Population}}$$ [65]

$$\textit{Average annual population shift} = \frac{\textit{Population at 1896 Census} - \textit{Population at 1890 Census}}{\textit{Population at 1890 census x 5}}$$ [66]

Average annual population shift is only a proxy for the stability of an electorate. It measures the average overall change in population size, rather than the numbers that arrived and left.

Figure 4.7 and Figure 4.8 show the relationship between these two variables and the Liberal vote. There is no clear relationship between the rural population proportion and Liberal voting, partly because the data-set contains no all urban electorates, and many all-rural electorates. Urban areas are excluded here, since they had more than one Liberal candidate. In 1893, many New Zealanders lived in rural areas, and there was much variation in the Liberal vote in all-rural electorates. A more finely grained measure might reveal a relationship between the rural proportion and Liberal voting, but the plot suggests that the rural population proportion was not relevant to Liberal voting in 1893. Figure 4.8 suggests neither was there a strong relationship

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[63] David Hamer, *New Zealand Liberals: The Years of Power* (Auckland: Auckland University Press, 1988), p.150.

[64] Charlotte Macdonald, 'Too Many Men and Too Few Women: Gender's 'Fatal Impact' in Nineteenth-Century Colonies,' in *The Gendered Kiwi*, ed. Caroline Daley and Deborah Montgomerie (Auckland: Auckland University Press, 1999).

[65] As before, this is calculated from figures provided in the Representation Commission Reports.

[66] This variable can be generalised to apply to all elections. Average population shift = (population at second census – population at first census)/(population at first census* number of years between censuses). Censuses were held approximately every five years, and census reports included population counts for electorates.

between the degree of population shift, and Liberal voting, although the plot reveals that Egmont was a definite outlier. There, the population had grown by a massive 13% each year between 1890 and 1893.

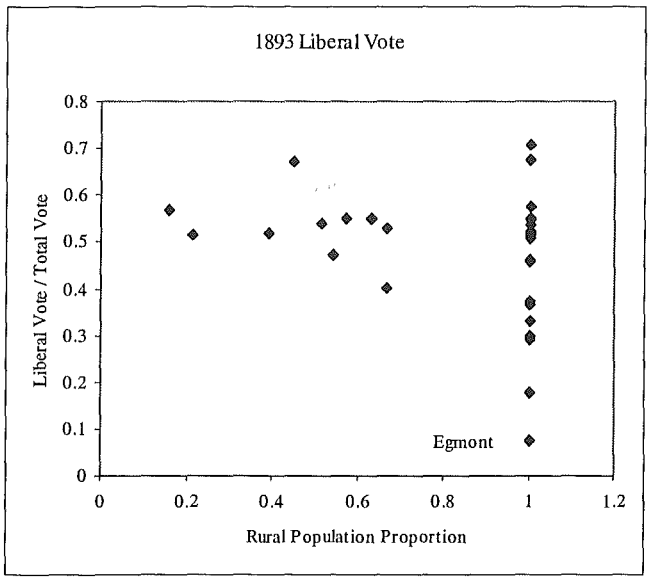

Figure 4.7 Rural Population Proportion and Liberal Voting in 32 Electorates, 1893

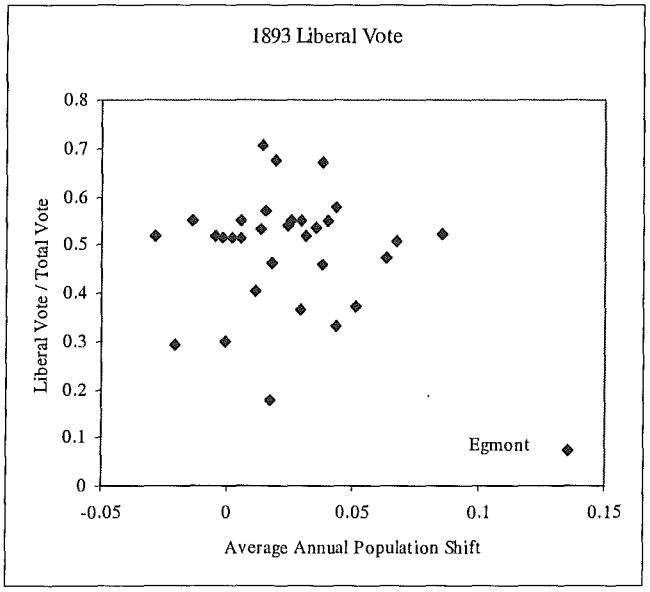

Figure 4.8 Average Annual Population Shift and Liberal Voting in 32 Electorates, 1893

A further potential contextual or confounding factor might be the degree of political mobilisation in an electorate. The extent to which women in each electorate were interested in politics might affect not only their turnout, but other aspects of voting behaviour in the electorate. For example, if the Liberals managed to mobilise women or women in their support, the Liberal vote may have been higher. Women's registration rate might reflect this factor. There is no equivalent measure for men, because the men's rolls were swelled by duplicate names. In some electorates the number of men's names on the roll exceeded the eligible population. Men's turnout is an alternative measure of men's political mobilisation. Another factor of interest is the fierceness of competition in an electorate which can be measured by the difference in the top two polling candidates. However, plots do not suggest that either men's or women's political mobilisation or the fierceness of competition affected the Liberal vote and are not shown here.

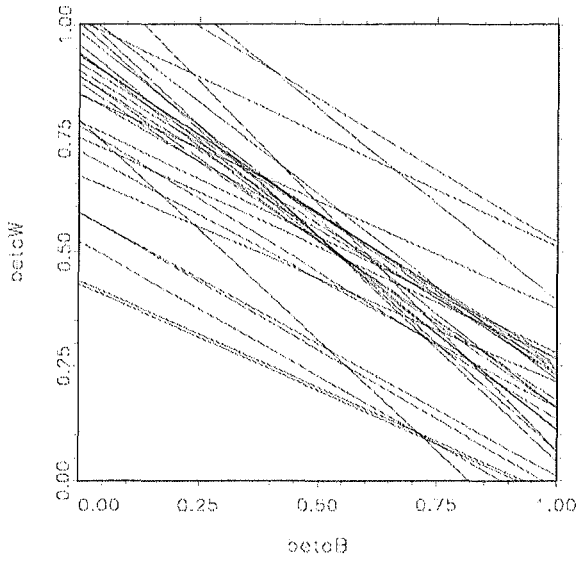

Figure 4.9 Tomography Plot for Liberal Voting in 30 Electorates, 1893 (Women's Liberal Vote / Total Women's Vote (β_{bj}) is shown on the x-axis and Men's Liberal Vote / Total Men's Vote (β_{wj}) is shown on the y-axis.)

A final characteristic of the data set is revealed by the tomography plot, shown in Figure 4.1 with all 32 electorates represented. A tomography plot with the outliers of Egmont and Wairarapa excluded is shown in Figure 4.9. Each line on the plot corresponds to an electorate. The unknown values for women's Liberal vote (β_{bj}) and men's Liberal vote (β_{wj}) must lie on the line. Figure 4.9 suggests that there were three groups of electorates. The lines for most electorates bunch together in the middle of the graph. There is a second group of electorates that lie at the bottom of the

graph, and a further three electorates that group together at the top of the graph. Voting patterns may be quite different in these three groups of electorates. Data-sets that show distinct sub-groups are said to exhibit multimodality. The existence of multiple modes can bias estimates produced by models for ecological inference, and it is generally best to analyse the sub-sets separately. However, King's non-parametric method can be applied to data that exhibits multi-modality.[67]

Overall then, although the Palmquist inflation factor is high, and the bounds are wide, there is little evidence of aggregation bias due to measurable contextual variables once two outliers are removed. Unfortunately, graphical identification of aggregation bias is far from foolproof because it can not investigate relationships of potential contextual or confounding variables with the unknown men's and women's party votes, but uses instead a proxy for the unknowns, the overall party vote. Furthermore, aggregation bias may be caused by other factors that we cannot measure; factors such as party mobilisation in an electorate, the comparative wealth of electorates, or an electorate's age structure. Especially in 1893 before a national media and strong party structures, local election effects are likely to influence electorate results. Factors like candidates' incumbency, local issues, and local newspapers partisanship are not easily quantifiable without a large amount of further research, and I do not test for aggregation bias due to such factors. One factor that will clearly affect the proportion of votes a candidate receives is the number of candidates in an electorate. This data-set includes eleven electorates with more than one candidate. The lowest proportion of votes were received by the Liberal candidates in Egmont and Wairarapa, which both had three candidates. It seems wise to exclude these electorates.

A final disadvantage with the data-set is that it contains only a small number of groups. We only have 32 out of a possible 62 non-Maori electorates from which to estimate the gendered Liberal vote in 1893. The excluded electorates have either no Liberal party candidates or more than one candidate representing the Liberal party. By 1919, party lines have stabilised, and the number of groups is larger, but still not large compared with other applications. Corder and Wolbrecht used 898 groups from 3 states in one trial.[68]

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[67] King, *A Solution to the Ecological Inference Problem*, p.187.

[68] Corder and Wolbrecht, *Using Prior Information to Aid Ecological Inference*. Steel and Holt report that a small number of groups can lead to unreliable inference. Steel and Holt, 'Rules for Random Aggregation,' p.976.

So far, ecological inference looks unpromising, but an empirical trial with the turnout data will provide a final check.

An Empirical Trial of Methods for Ecological Inference

In this section a number of methods for ecological inference are used to estimate men's and women's turnout rates at the 1893 election. These methods are Goodman's ecological regression, King's parametric and non-parametric methods, the semi-parametric and the homogeneous method. The best of these methods are then used to estimate men's and women's turnout at elections from 1896 until 1919. Since men's and women's turnout rates are known, the estimates produced by these methods can be compared with the known true values to assess how well the various methods work. Ecological inference proceeds as if the true values are not known.

Consider the 59 electorates in 1893 where elections were held. For each of the 59 electorate we have a contingency table like the following:

Table 4.8 Turnout in the Riccarton Electorate, 1893

Riccarton, 1893	Vote	Don't Vote	Total
Women	1417 0.6415	792 0.3585	2209
Men	1511 0.5925	1039 0.4075	2550
Total	2928	1831	4759

and an equation for each electorate:

$$t_j = \beta_{bj} x_j + \beta_{wj} (1-x_j)$$

where

x_j = adult women/adult population;

t_j = votes cast/adult population;

v_{fj} = votes cast by women;

v_{mj} = votes cast by men;

β_{bj} = votes cast by women/adult women;

β_{wj} = votes cast by men/adult men;

n_j = adult population.

In this case the true values for β_{bj} and β_{wj} are known, [69] and are shown on the tomography plot in Figure 4.10. The tomography lines reflect the bounds placed on the internal cell values by the marginal frequencies, and do not take the known true values into account.

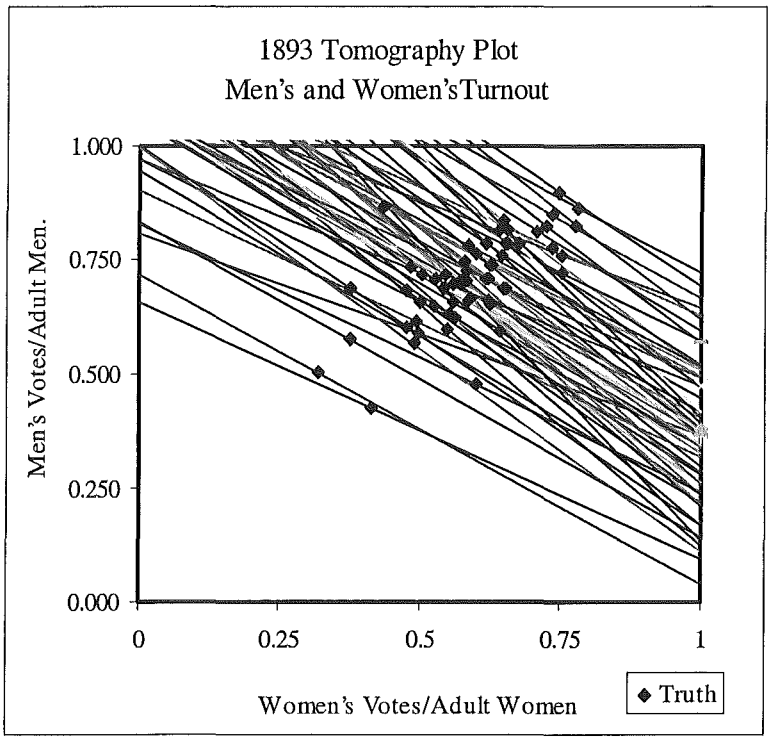

Figure 4.10 Tomography Plot with True Values shown for Men's and Women's Turnout, 1893

The turnout data share some characteristics with the data on Liberal voting. Gender proportions between electorates are similar, and there are no groups of mainly men or mainly women. The inflation factor is high at 62.0, suggesting high aggregation bias. For most electorates, the tomography lines are spread across the graph, indicating wide bounds, and these bounds are shown in Figure 4.11 and Figure 4.12. Note that the bounds on men's turnout are shorter than those on women's turnout.

[69] True values of men's and women's turnout in each electorate in 1893 were listed in Table 3.3 in Chapter 3.

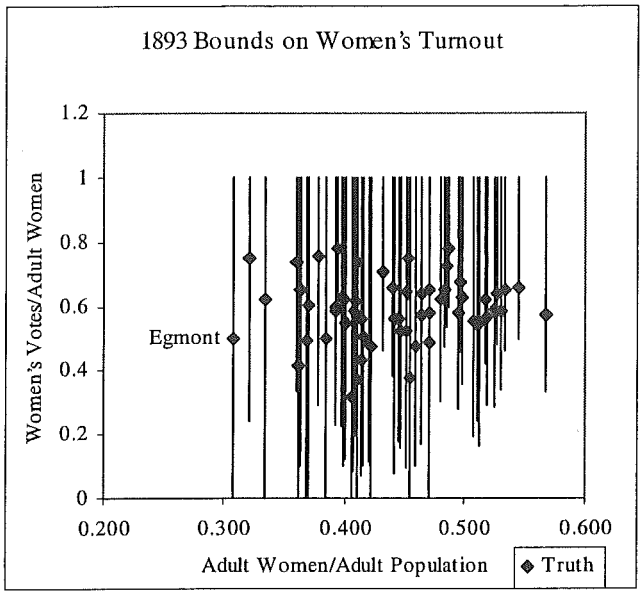

Figure 4.11 Bounds on Women's Turnout, 1893, with True Women's Turnout Marked

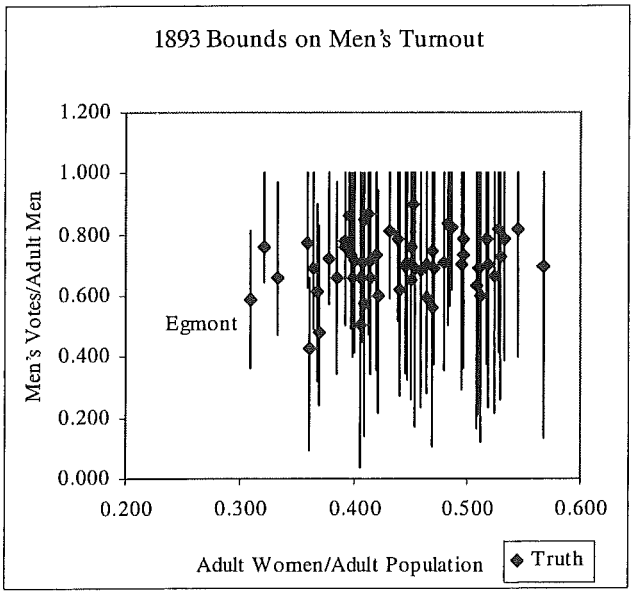

Figure 4.12 Bounds on Men's Turnout, 1893, with True Men's Turnout Marked

Plots of overall turnout against a number of variables including rural population proportion show no evidence of aggregation bias, and so are not shown here. However, there is evidence of aggregation bias due to average population shift, as shown in Figure 4.13. The pattern is largely due to two outliers, Egmont and Bay of Plenty, electorates with large population growth. Excluding these may improve the estimates.

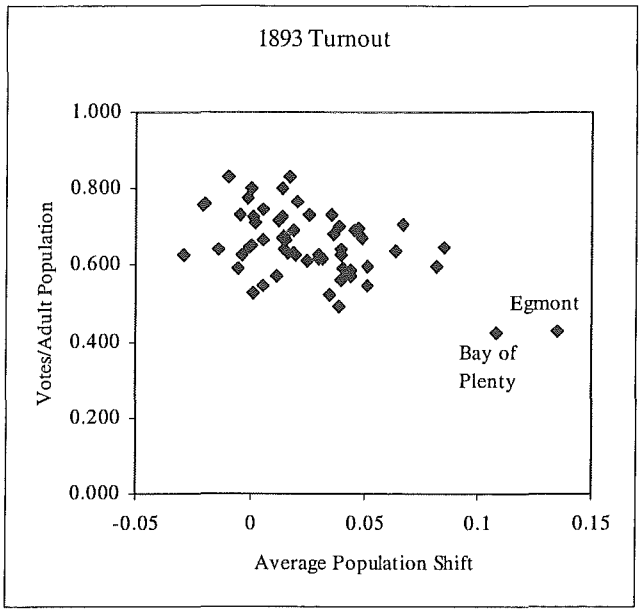

Figure 4.13 Average Population Shift and Turnout, 1893

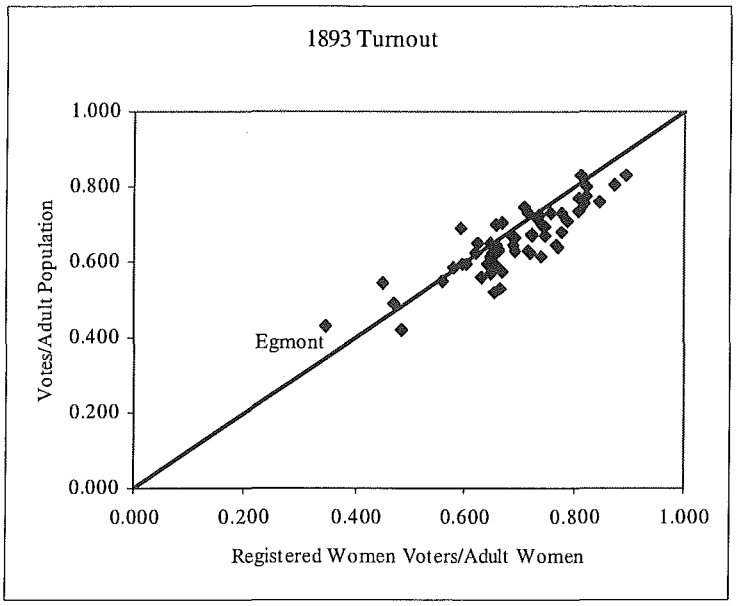

Figure 4.14 Women's Registration and Turnout, 1893

Figure 4.14 shows that there was a strong relationship between women's registration rate and overall turnout. This makes sense, since both variables reflect political mobilisation. It may be wise to include women's registration as a co-variate.

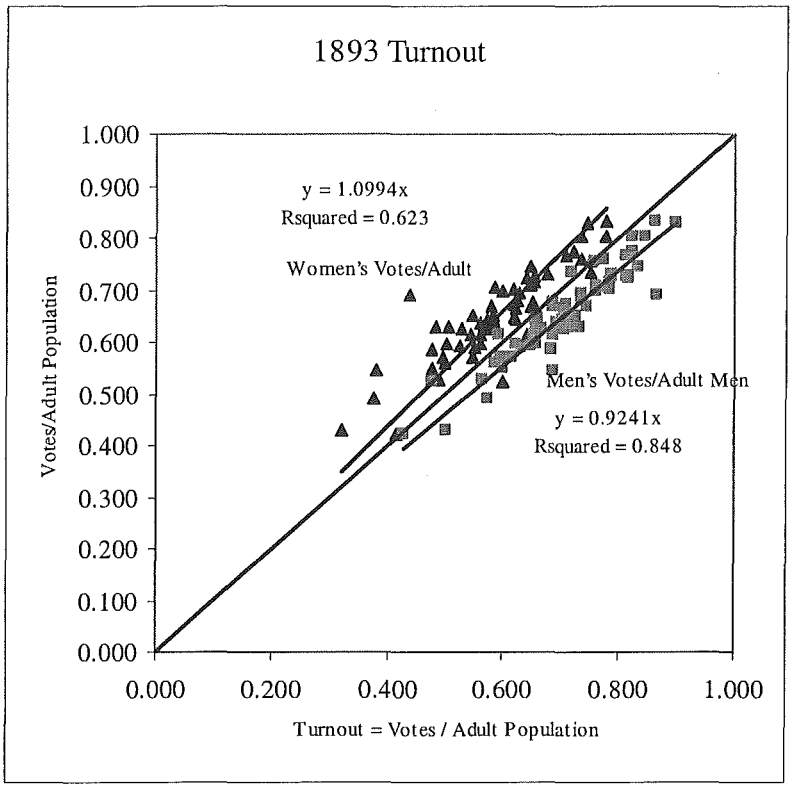

Figure 4.15 Total Turnout and Men's and Women's Turnout, 1893

In the face of aggregation bias, it is unlikely that Goodman's simple ecological regression, or King's parametric methods will perform well. Other methods may be more reasonable. It seems likely that the semi-parametric method will perform well with turnout data since its assumption, that β_{wj}, men's turnout, is linearly related to y_j, overall turnout, is reasonable. Examining the true values shows that both men's and women's turnout were closely related to total electorate turnout, as shown in Figure 4.15. The homogeneous method makes the assumption of homogeneity, which is the assumption that men's and women's turnout is similar across electorates. There is variation between electorates, detailed in Table 4.9. Moreover, the heterogeneity test using the chi-square statistic detailed in the previous chapter suggests that this assumption does not hold.

Table 4.9 Descriptive Statistics for Women's and Men's Electorate Turnout, 1893

n=59	Minimum	Lower Quartile	Median	Upper Quartile	Maximum
Women	0.318	0.535	0.586	0.649	0.780
Men	0.425	0.656	0.706	0.778	0.898

Estimates of the overall quantities β_b and β_w produced by the various methods are shown in Table 4.10. The performance of a method is reflected in the closeness of overall estimates to the known true values, and also in the closeness of the electorate estimates to the known true values. Table 4.10 shows overall estimates and the V-values or relative root mean squared errors, which measure the quality of the P electorate estimates. Smaller values indicate better estimates. The V-values are calculated using the following formulas.

$$V_b = \frac{1}{\hat{\beta}_b}\sqrt{\frac{\sum_{j=1}^{P}\left(\hat{\beta}_{bj} - \beta_{bj}\right)^2}{P}}$$

$$V_w = \frac{1}{\hat{\beta}_w}\sqrt{\frac{\sum_{j=1}^{P}\left(\hat{\beta}_{wj} - \beta_{wj}\right)^2}{P}}$$

Note that this measure does not reveal whether the estimates are consistently above or below the truth, but the average distance of the estimates from the true value.

Table 4.10 Overall Estimates for Women's and Men's Turnout in 1893, Excluding the Electorates of Egmont and Bay of Plenty[70]

Method (n=57)	Women's Turnout $\hat{\beta}_b$ (Standard Error)	Relative Root Mean Square Error Women's Turnout V_W	Men's Turnout $\hat{\beta}_w$ (Standard Error)	Relative Root Mean Square Error Men's Turnout V_M
True	0.5996		0.7172	
Goodman	0.6917 (0.0989)		0.6378 (0.0791)	
Ezl:parametric	0.6343 (0.0079)	0.1800	0.6870 (0.0066)	0.1829
Ezl: non-parametric	0.6428 (0.0334)	0.1792	0.6799 (0.0280)	0.1540
Homogeneous	0.6442 (0.0009)	0.1112	0.6620 (0.0008)	0.0788
Semi parametric	0.6637	0.1046	0.6422	0.0722

Table 4.10 shows the overall estimates and V-values for estimations based on 57 electorates, so that the two outlying electorates are included in the data-set.[71] Most estimates are reasonable, with

[70] I am grateful to Dr Beh for calculating the V-values shown in Table 4.10 and for drawing the graphs shown in Figures 4.16, 4.18, 4.20-4.22. Note that no standard errors are produced under the semi-parametric method.

the exception of the Goodman estimates which are implausible. The Goodman estimates suggest that women's turnout substantially exceeded men's. The estimate of women's voting rate was 69%. The estimate of men's voting rate was much lower at 64%. As was the case when applying Goodman's regression to estimate women's and men's Liberal vote, in 1893, estimation required extrapolating far from the points used to define the regression model. The Goodman regression line is shown in Figure 4.16. Goodman's method is inappropriate here where there is little variation in the x-variable.

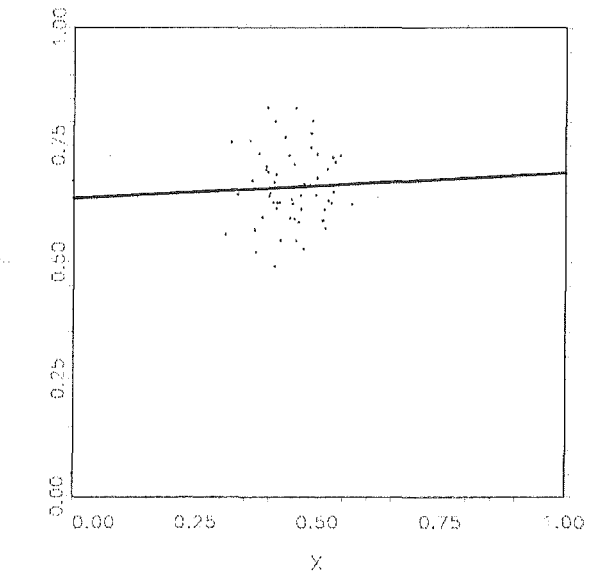

Figure 4.16 Scatter Plot with Goodman Regression Line Shown, Turnout, 1893 (The proportion of adult women in the adult population (x_j) appears on the x-axis and proportion of all adults who cast a vote (t_j) on the y-axis.)

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[71] Exclusion of the outliers did not substantially improve the estimates, but it mostly lowered the standard errors and improved the electorate estimates. The overall estimates when the outliers were included were

Method (n=59)	Women's Turnout $\hat{\beta}_b$ (Standard Error)	Men's Turnout $\hat{\beta}_w$ (Standard Error)
True	0.5920	0.7061
Goodman	0.7585 (0.1090)	0.5708 (0.0864)
Ezl:parametric	0.6366 (0.0122)	0.6680 (0.0101)
Ezl: non-parametric	0.6467 (0.0314)	0.6597 (0.0261)
Homogeneous	0.6428 (0.0009)	0.6640 (0.0008)
Semi parametric	0.6425	0.6642

The overall estimates produced by King's parametric method are more reasonable. These estimates suggest that 64% of women voted and 67% of men. Compared with the Goodman estimates, the parametric estimates are closer to the true values of 60% and 72%. However the parametric estimates suggest only a small difference between men's and women's turnout, substantially smaller than the true difference. The relative root mean squared errors suggest that electorate estimates were poor, though not exceptionally so. Examination of plots of the true and estimated electorate values, shown in Figure 4.17, reveal that the parametric estimates of women's turnout, shown in the left hand graph, were surprisingly uniform. The method produced electorate estimates for women's turnout with mean 0.6343 and standard deviation of only 0.0032. Electorate estimates for men's turnout had mean 0.6847 and a larger standard deviation of 0.1373. The problem clearly stemmed from the truncated bi-variate normal assumption since contour plots were narrow on the β_b axis, as shown in Figure 4.18.

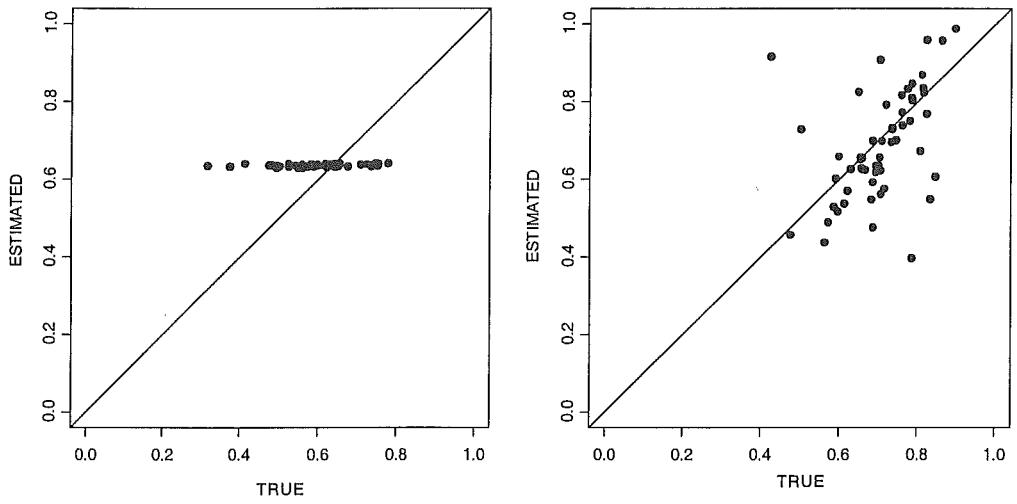

Figure 4.17 True Women's and Men's Turnout and Parametric Estimates of Men's and Women's Turnout in 57 Electorates, 1893 (True and estimated women's electorate turnout is shown in the left hand graph, and true and estimated men's turnout is shown in the right hand graph.)

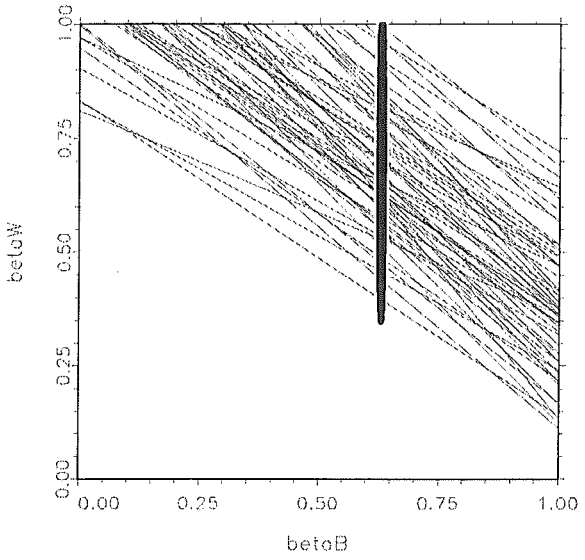

Figure 4.18 Tomography Plot with Contour Ellipses for Estimating Men's and Women's Turnout in 1893 (Women's Turnout (β_{bj}) is shown on the x-axis and Men's Turnout (β_{wj}) is shown on the y-axis.)

King does provide a number of options for adjusting the model. Adjustments, particularly including co-variates, did improve the results. The best results are shown in Table 4.11. Including women's registration rate somewhat improved the estimates, as did including rural population proportion. Including average population shift did not. While prior knowledge can inform which settings to choose, the number of adjustments that can be made to the basic model is large. A large number of different models were tried, only to conclude that most of the adjustments made little difference. The advantage of being able to add additional information to King's model needs to be offset against the time investment, especially when, Table 4.10 indicates, other methods did better without time-consuming modifications. Moreover, while the V-values were much improved by the adjustments detailed in Table 4.11, the electorate estimates of women's turnout remained uniform. The adjustments listed in that table marginally improved the variation in the electorate estimates of women's turnout, but it remained much lower than amongst men's electorate turnout. The standard deviations of the electorate estimates under the adjusted models are shown in Table 4.11.

Table 4.11 Overall Estimates for Women's and Men's Turnout, 1893, from Modified Versions of King's Parametric Method for Ecological Inference

Method	Women's Turnout $\hat{\beta}_b$	Relative Root Mean Square Error Women's Turnout V_W	Standard Deviation of Electorate Estimates of Women's Turnout	Men's Turnout $\hat{\beta}_w$	Relative Root Mean Square Error Men's Turnout V_M	Standard Deviation of Electorate Estimates of Men's Turnout
Truth.	0.5996			0.7172		
Registered Women / Adult Women included as a prior on the estimates of women's turnout[72]	0.6141 (0.0129)	0.1175	0.0236	0.7040 (0.0108)	0.0772	0.1238
Rural population proportion included as a prior on estimates of women's turnout[73]	0.6373 (0.0078)	0.1484	0.0189	0.6845 (0.0065)	0.1073	0.1360
Rural population proportion included as a prior on estimates of women's and men's turnout[74]	0.6367 (0.0106)	0.1488	0.0121	0.685 (0.0089)	0.1067	0.1357

The non-parametric method did slightly better, although there was some evidence that the assumption of mean independence did not hold. The overall non-parametric estimates, shown in Table 4.10, were similar to those of the parametric method, but its electorate estimates were better, as reflected in the lower V-values. Plots of the true and estimated electorate values are shown in Figure 4.19. As shown in Table 4.10, non-parametric estimates had large standard errors. The standard errors of the estimates for individual electorates are not shown here, but these were also large. Large standard errors reflect the uncertainty of the estimates, and merely remind the researcher of the uncertainty in the estimation process. Figure 4.20 shows the electorate non-parametric estimates on the tomography plot. Each line on the plot represents an electorate. The true values for men's and women's turnout for each electorate must lie on the appropriate line. The non-parametric estimates are marked on the line. This plot can be compared with that of Figure 4.10 where the true values are shown on a tomography plot.

[72] The exact settings in EzI were z_b = registered women/adult women, $alpha_b$ = 0.0001, 0.0001.

[73] The EzI settings were z_b = rural population proportion, $alpha_b$ = 0.0001, 0.1

[74] The EzI settings were $z_b = z_w$ = rural population proportion, $alpha_b = alpha_w$ = 0.0001, 0.1

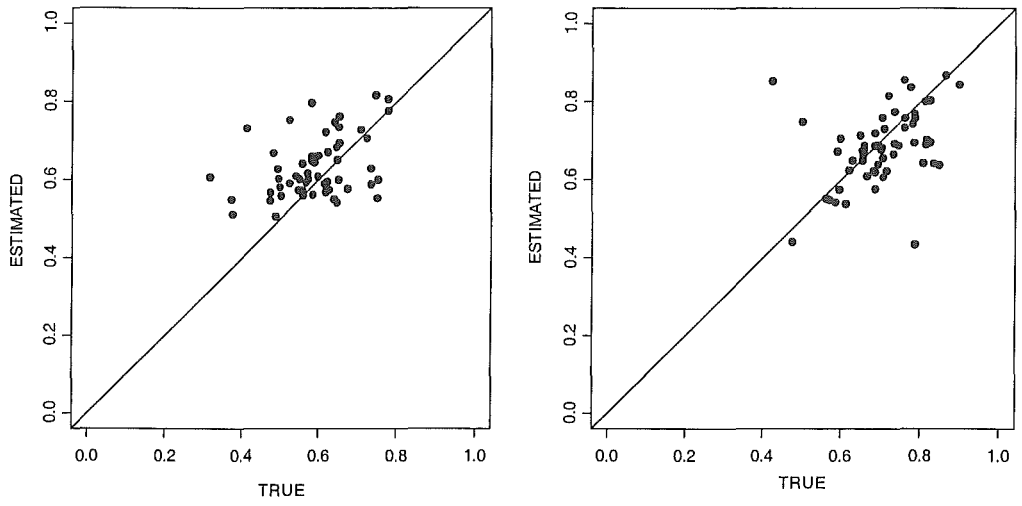

Figure 4.19 True Women's and Men's Turnout and Non- Parametric Estimates of Men's and Women's Turnout in 57 Electorates, 1893 (True and estimated women's electorate turnout is shown in the left hand graph, and true and estimated men's turnout is shown in the right hand graph.)

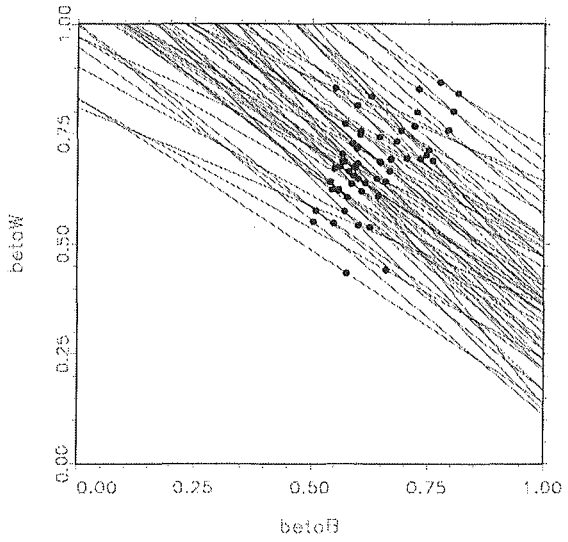

Figure 4.20 Tomography Plot for Men's and Women's Turnout, with Non-Parametric Estimates, 1893 (Women's Turnout (β_{bj}) is shown on the x-axis and Men's Turnout (β_{wj}) is shown on the y-axis.)

The homogeneous method provided reasonable overall estimates, shown in Table 4.10, which were similar to those produced by other methods. The V-values were low, indicating that electorate estimates were better than for either King's parametric or non-parametric method. Plots of the true and estimated values are shown in Figure 4.21.

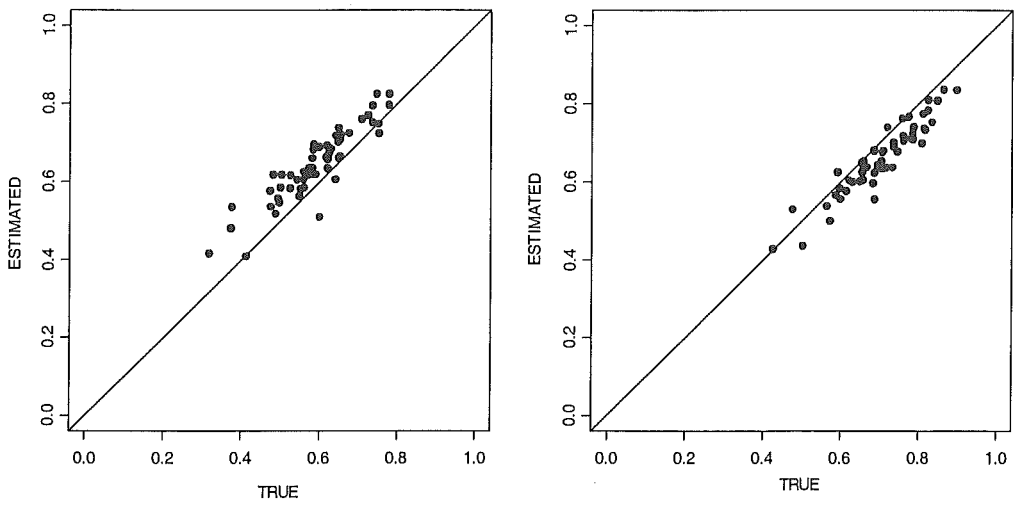

Figure 4.21 True Women's and Men's Turnout and Homogeneous Estimates of Men's and Women's Turnout in 57 Electorates, 1893 (True and estimated women's electorate turnout is shown in the left hand graph, and true and estimated men's turnout is shown in the right hand graph.)

Using the score test, the homogeneous method allows the testing of the assumption that there was homogeneity amongst electorates. This is the assumption that women's turnout was similar across all electorates, and that men's turnout was similar across all electorates. Those electorates with high score test statistics may have parameters π_{bj} and π_{wj} which differ from the overall parameters π_b and π_w and thus the assumption of homogeneity would not apply. It can also be useful to check if departures from homogeneity are in any way related to $x_{j,}$, which here is votes cast by women/number of adult women for each electorate. Two electorates, Bay of Islands and Eden were identified as having a high score test statistics, but there was no distinct pattern in the score test statistics overall, as shown in the left hand plot of Figure 4.22.[75]

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[75] The overall individual score test statistic calculated using the known electorate data , $ST^{(1)}$, is 12639.74 (p = 0.5950). The overall aggregate score test statistic calculated using the overall estimates, $ST^{(2)}$, is 10425.89 (p = 0.7031). The aggregate score test statistic data identifies 42 electorates with estimates significantly different from the overall values.

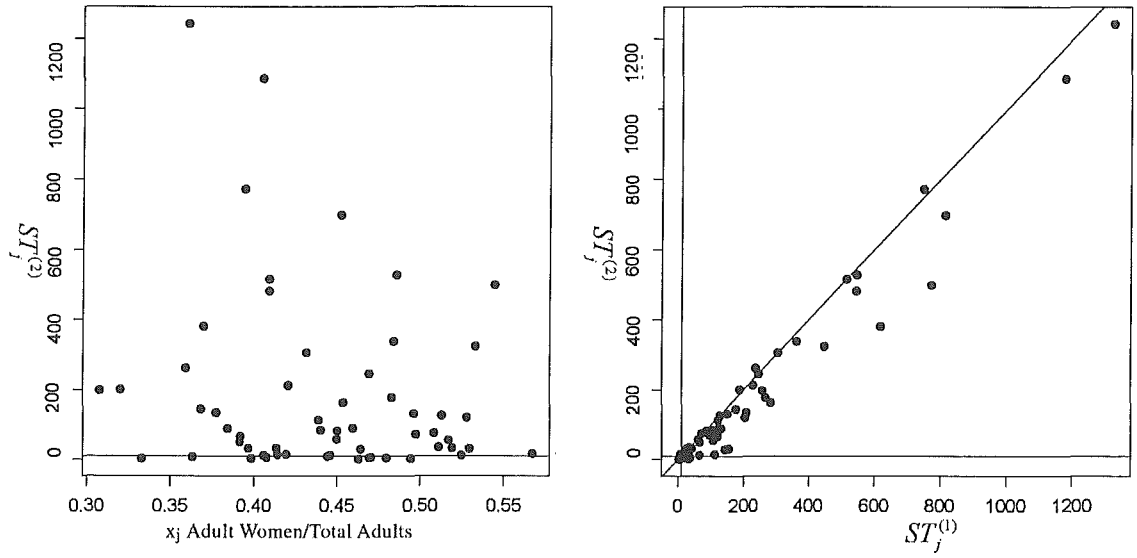

Figure 4.22 Plots of the Aggregate Data Score Test Statistic, $ST_j^{(2)}$, versus Women's Votes/Adult Women, x_j, and the Individual Data Score Test Statistics, $ST_j^{(1)}$

The overall estimates obtained using the semi parametric method, shown in Table 4.10 suggest that 64% of women cast a vote and 66% of men. These are very similar to the estimates prodiced by other methods. However, the V-values suggest that the semi-parametric electorate estimates were closest to the known true values. True and estimated values for men's and women's turnout are shown in Figure 4.23. Note that the electorate estimates are very similar to those obtained using the homogeneous method, although the weighted mean of the semi-parametric electorates estimates gives slightly different overall estimates to those of the homogeneous method.

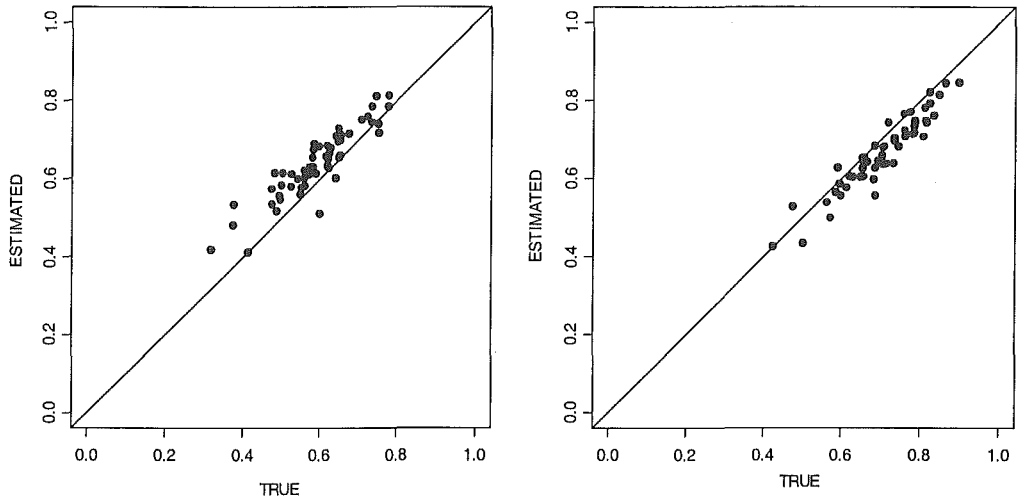

Figure 4.23 True Women's and Men's Turnout and Semi- Parametric Estimates of Men's and Women's Turnout in 57 Electorates, 1893 (True and estimated women's electorate turnout is shown in the left hand graph, and true and estimated men's turnout is shown in the right hand graph.)

This trial has shown that some methods performed better than others. Neither Goodman's nor King's parametric methods performed well. While King's method produced reasonable overall estimates, its electorate estimates for women's turnout were unreasonably uniform. The same problem occurred when this method was used to estimate women's and men's turnout at some, though not all elections between 1896 and 1919, and so further trials of the parametric method are not shown here. The other three methods trialled produced reasonable overall and electorate estimates for men's and women's turnout in 1893.

The non-parametric, semi-parametric and homogeneous methods continued to do well when used to obtain estimates of men's and women's turnout at later elections. Overall estimates obtained using these methods for elections from 1896 until 1919 are shown in Table 4.12. Plots of the estimates and the true values are shown in Figure 4.24 to Figure 4.32.[76] If all electorate estimates were equal to the known true values, all points would fall on the diagonal y = x line. For all three methods, points fall on or near this line, indicating that estimates are very near to the known true values.

[76] These plots were drawn by Dr Eric Beh.

Table 4.12 Estimates of Women's and Men's Turnout, 1896 to 1919

Year	N	True Women's Turnout	Ezl Non-Parametric		Semi-parametric		Homogeneous[77]		True Men's Turnout	Ezl non-parametric		Semi-parametric		Homogeneous	
			Estimate of Women's Turnout Standard Error	V_W	Estimate of Women's Turnout (alpha=0)	V_W	Estimate of Women's Turnout	V_W		Estimate of Men's Turnout Standard Error	V_M	Estimate of Men's Turnout (alpha=0)	V_M	Estimate of Men's Turnout	V_M
1896	62	0.6882	0.7192	0.1024	0.7324	0.1034	0.7126	0.0867	0.7689	0.7961	0.0690	0.7330	0.0691	0.7491	0.0549
			0.0264		γ = 0.9958		0.0007			0.0197				0.0006	
1899	59	0.7568	0.7489	0.0575	0.7674	0.0435	0.7203	0.1787	0.7908	0.7750	0.0379	0.7607	0.0304	0.7972	0.1565
			0.0205		γ = 1.0000		0.0007			0.0161				0.0004	
1902	68	0.7452	0.7468	0.0738	0.7710	0.0616	0.7422	0.0512	0.7684	0.7831	0.0455	0.7635	0.0425	0.7869	0.0316
			0.0205		γ = 1.0032		0.0006			0.0166				0.0004	
1905	76	0.8223	0.8228	0.0431	0.8428	0.0418	0.8145	0.0344	0.8407	0.8404	0.0299	0.8242	0.0294	0.8470	0.0207
			0.0115		γ = 1.0091		0.0004			0.0092				0.0003	
1908	76	0.7826	0.7838	0.0502	0.7875	0.0250	0.7784	0.0240	0.8111	0.8101	0.0442	0.8071	0.0204	0.8146	0.0204
			0.0131		γ = 0.9867		0.0004			0.0108				0.0003	
1911	76	0.8248	0.8296	0.0390	0.8385	0.0414	0.8209	0.0364	0.8443	0.8404	0.0272	0.8328	0.0278	0.8476	0.0239
			0.0119		γ = 1.0010		0.0003			0.01				0.0003	
1914	76	0.8373	0.8348	0.0398	0.8413	0.0272	0.8346	0.0264	0.8543	0.8564	0.0288	0.8510	0.0211	0.8566	0.0208
			0.0115		γ = 0.9925		0.0003			0.0096				0.0002	
1919 Prohibition poll	76	0.7922	0.7758	0.0581	0.7816	0.0485	0.7671	0.0555	0.7506	0.7662	0.0523	0.7606	0.0370	0.7744	0.0434
			0.016		γ = 1.0106		0.0004			0.0152				0.0004	
1919	76	0.7952	0.8013	0.0443	0.8062	0.0339	0.7974	0.0318	0.8141	0.8085	0.0384	0.8039	0.0301	0.8120	0.0273
			0.0149		γ = 1.0002		0.0004			0.0138				0.0003	

[77] These figures are based on those in. Beh and others, 'An Empirical Evaluation of Ecological Inference Techniques: Gender and Turnout at New Zealand Elections, 1893 - 1919.' Note that in later elections n_j = the number of registered voters rather than the adult population.

Overall, the non-parametric method provided excellent aggregate estimates, but the V-values suggest that its electorate estimates were, in general, not as good as those produced by the semi-parametric and homogeneous methods, which had lower V-values. In Figure 4.24 to Figure 4.32 the non-parametric estimates are generally further from the y = x line than the electorate estimates obtained under the semi-parametric and homogeneous methods. For most years, there was evidence that mean independence did not hold. Plots of the estimates β_{bj} and β_{wj} against x_j, the proportion of women in the electorate, suggested that the estimates were dependent on x_j. However, the estimates remained reasonable.

Overall estimates produced by the semi-parametric method wrongly suggested that women's turnout exceeded men's at a number of elections, but its electorate estimates were consistently very good. Recall that this method is a modification of the neighbourhood method. This method assumes that $\beta_{bj} = \gamma\ t_j$, calculating γ from the mid-point of the bounds, assuming that γ is uniformly distributed. Here, the values for γ were close to one for all elections, indicating that the semi-parametric method did not give estimates very different from the neighbourhood method. The values for γ are shown in Table 4.12 underneath the estimates for women's turnout. The fact that the semi-parametric estimates did not always match the true pattern suggests the assumptions of the method may not hold. In particular, γ may not be uniformly distributed.

The homogeneous method did consistently well, with the exception of 1899 when its estimates were poor. For other elections, aggregate estimates were very close to the true values, and low V-values indicated good electorate estimates. Over all the elections, the homogeneous method performed most reliably, with reasonable overall estimates and low V-values. It worked well despite indications that the assumption of homogeneity did not apply.

The empirical trial has shown that three methods for ecological inference little considered in the historical literature have produced good estimates of men's and women's turnout for a number of elections. Two of these methods, the semi-parametric and the homogeneous methods, have been only recently proposed. King's non-parametric method has had little consideration. The success of these methods with this data-set suggests that claims that methods for ecological inference cannot be applied to data classified by gender are over-stated. Here three methods for ecological inference performed well on data classified by gender.

The quality of the estimates produced by King's non-parametric method, the semi-parametric method and the homogeneous method was consistent over a number of different elections, which strengthens claims for the methods' success. However, further trials are needed. In particular, there needs to be further work on how much aggregation bias affects estimates produced by these methods, and on the consequences of applying the methods to data-sets where the assumptions do not hold. Wendy Cho used real-life and artificial data-sets to assess how King's methods performed under varying conditions, though she concentrated on his parametric method.[78] A similar approach could be used to test the performance of the semi-parametric method and the homogeneous method, and to further trial King's non-parametric method.

The success of a little used method, King's non-parametric method, and two recently proposed techniques, the semi-parametric and homogeneous methods, underscores the need for historians to keep up to date with developments outside the discipline of history, especially when applying quantitative analysis to historical data. However, in the case of ecological inference, the mathematics underlying new developments is not necessarily straightforward, and can be especially challenging for historians, who are, after all, not mathematicians. Statisticians and historians need to work together to critique methods from the perspectives of both disciplines.

The accessibility of methods can be a major factor in their uptake. The provision of free software that accompanied King's parametric method certainly encouraged its use. This factor ultimately governed my choice of which method would be applied to estimate men's and women's party and prohibition choices. Since software is available with which to implement King's non-parametric method, this technique is utilised in the following chapter to estimate men's and women's party and prohibition votes.

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[78] Cho, *Iff the Assumptions Fit*.

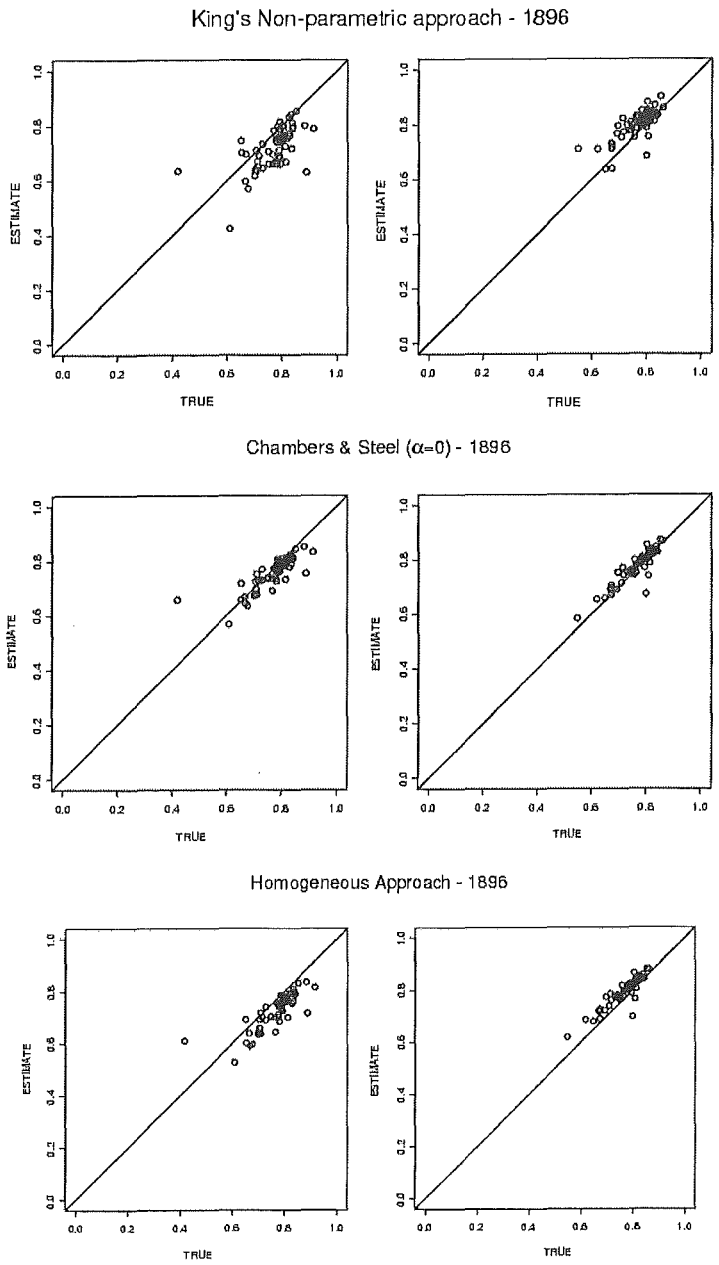

Figure 4.24 Estimates and True Values, Turnout 1896

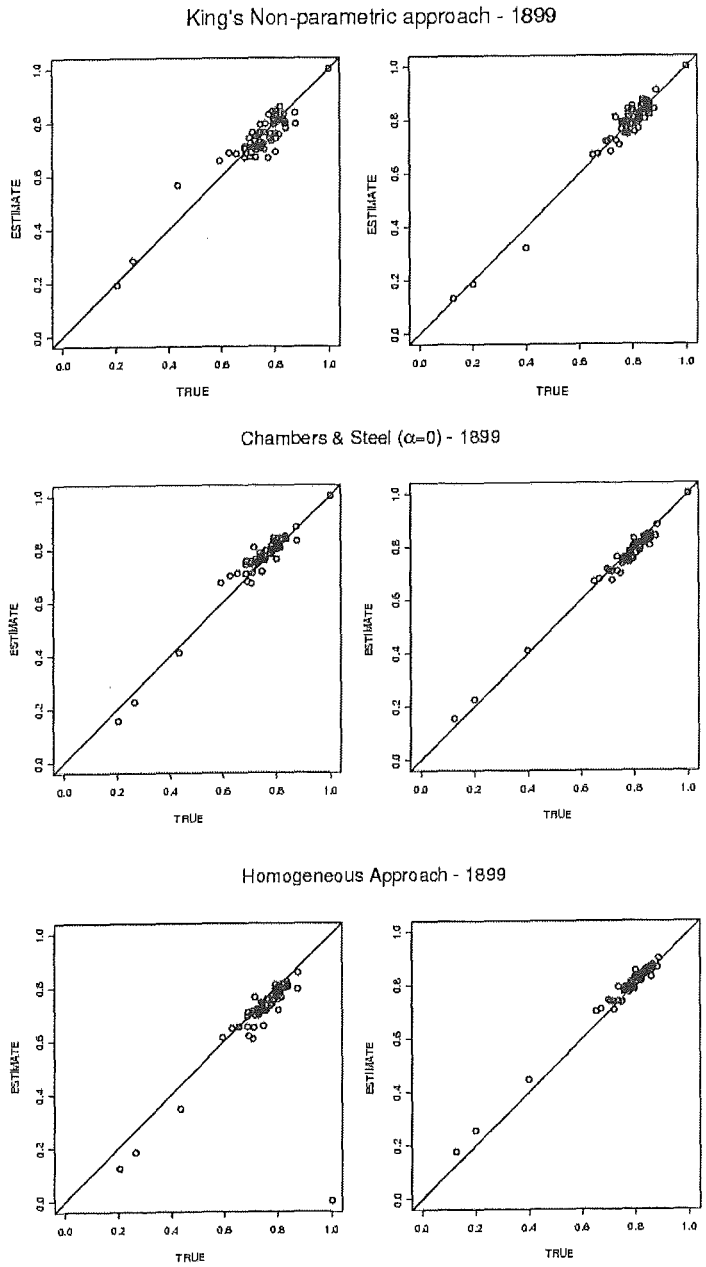

Figure 4.25 Estimates and True Values, Turnout 1899

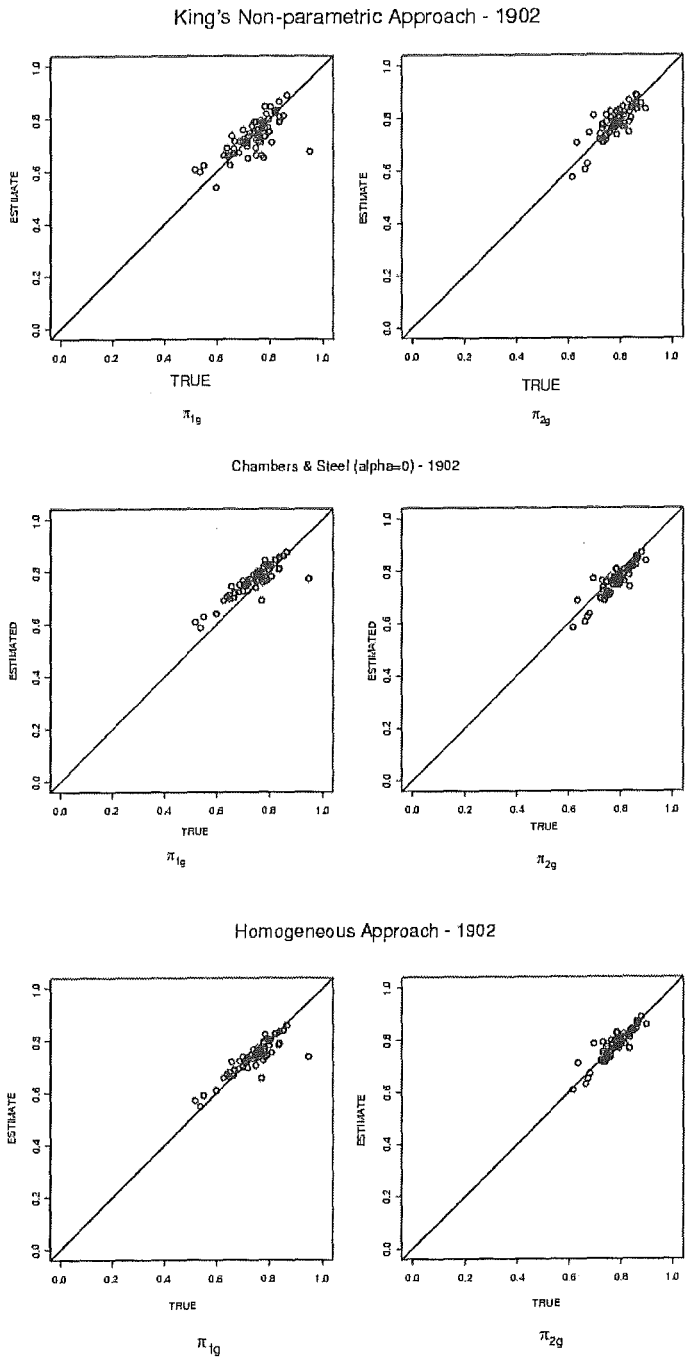

Figure 4.26 Estimates and True Values, Turnout 1902

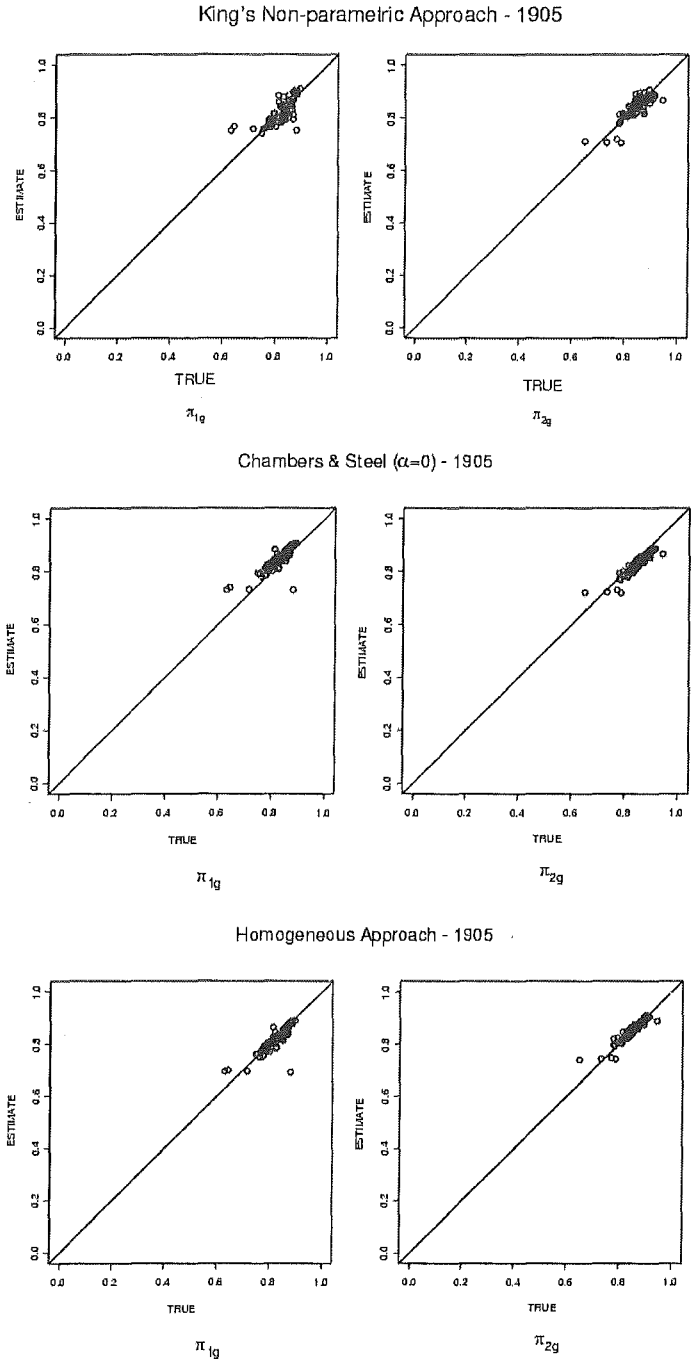

Figure 4.27 Estimates and True Values, Turnout 1905

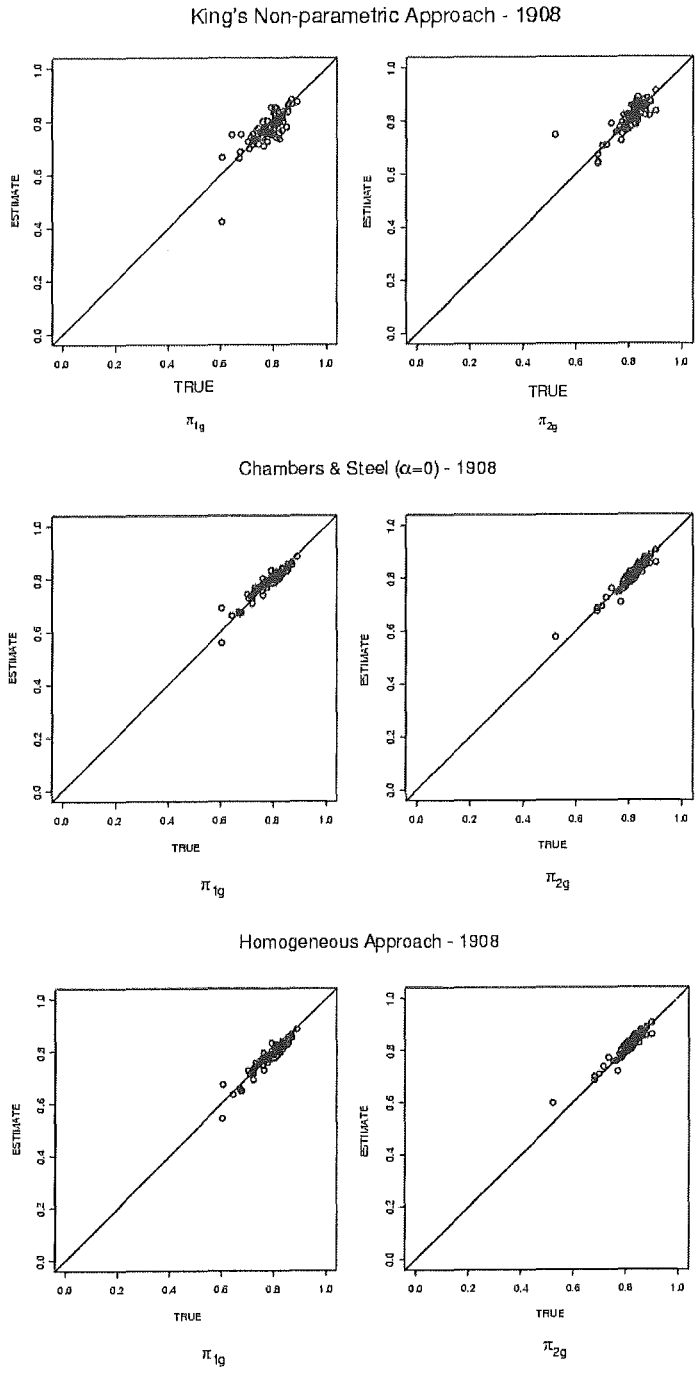

Figure 4.28 Estimates and True Values, Turnout 1908

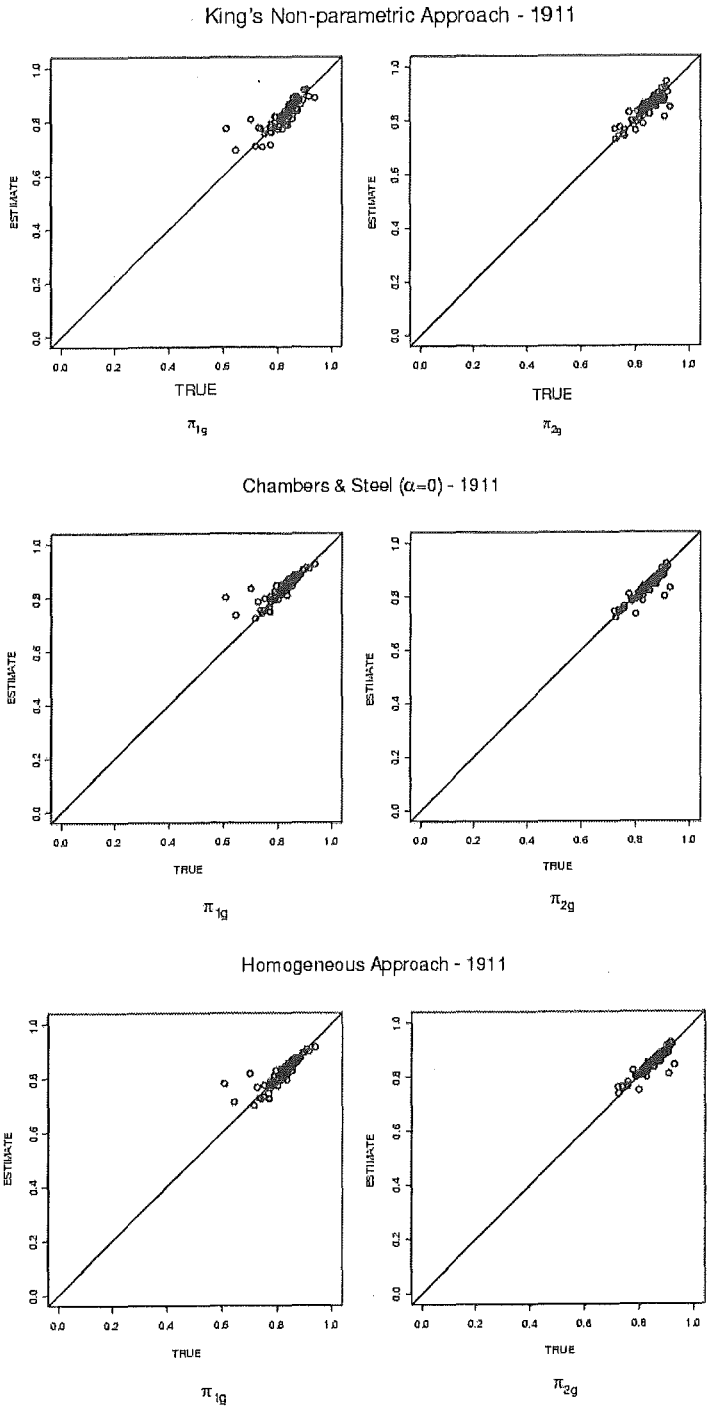

Figure 4.29 Estimates and True Values, Turnout 1911

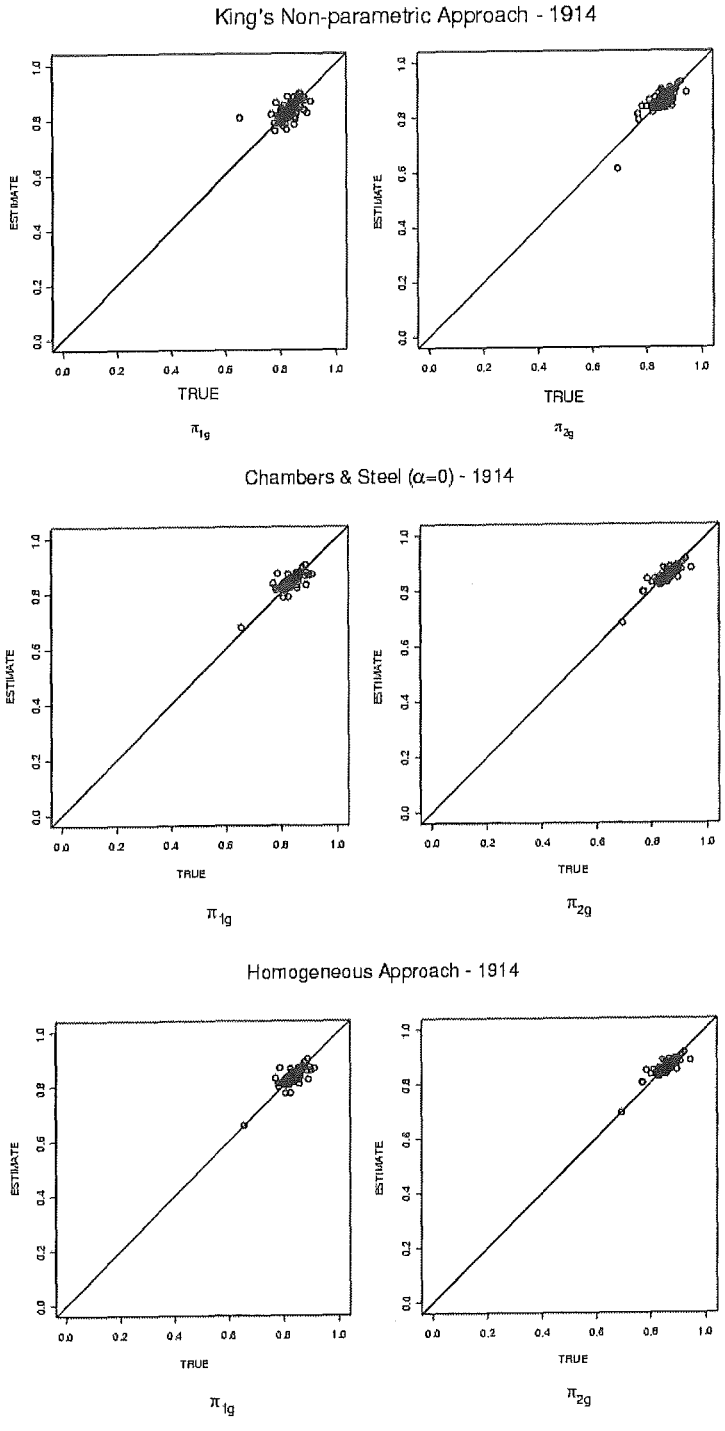

Figure 4.30 Estimates and True Values, Turnout 1914

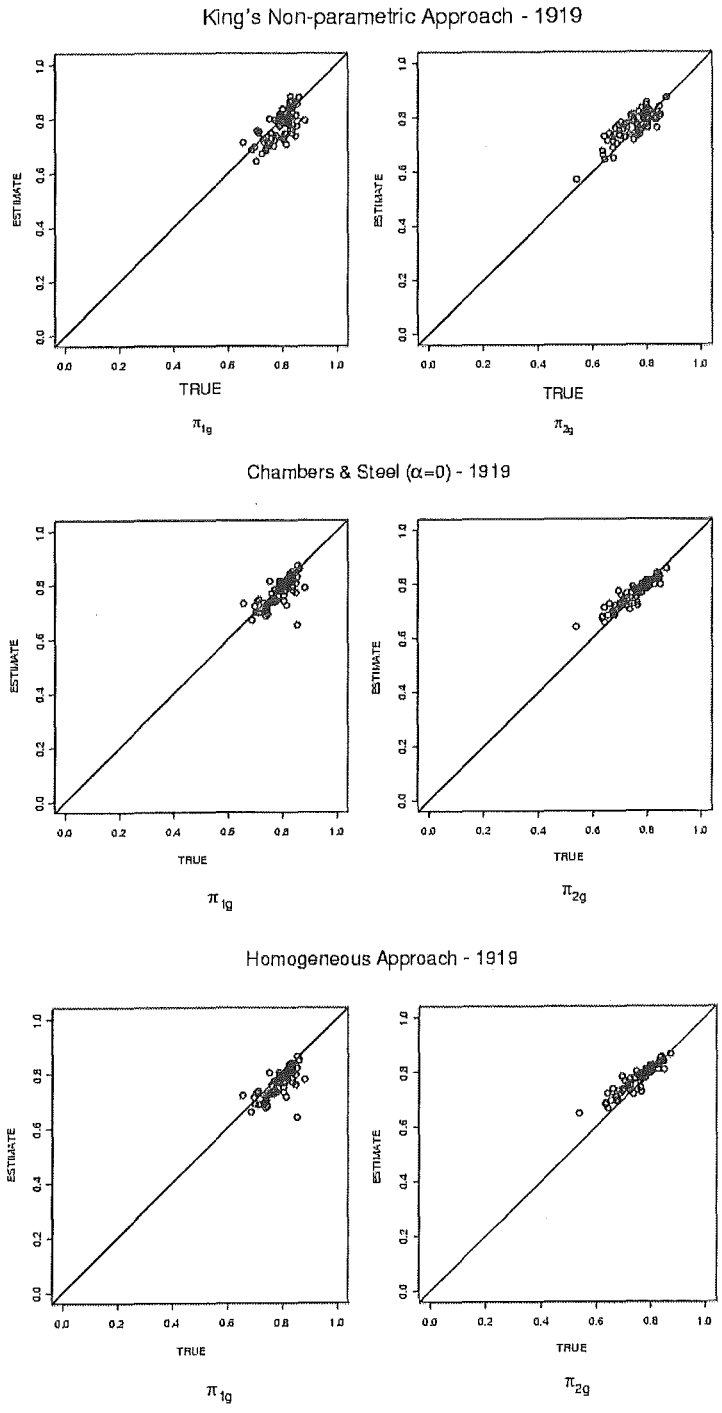

Figure 4.31 Estimates and True Values, Prohibition Poll, Turnout April 1919

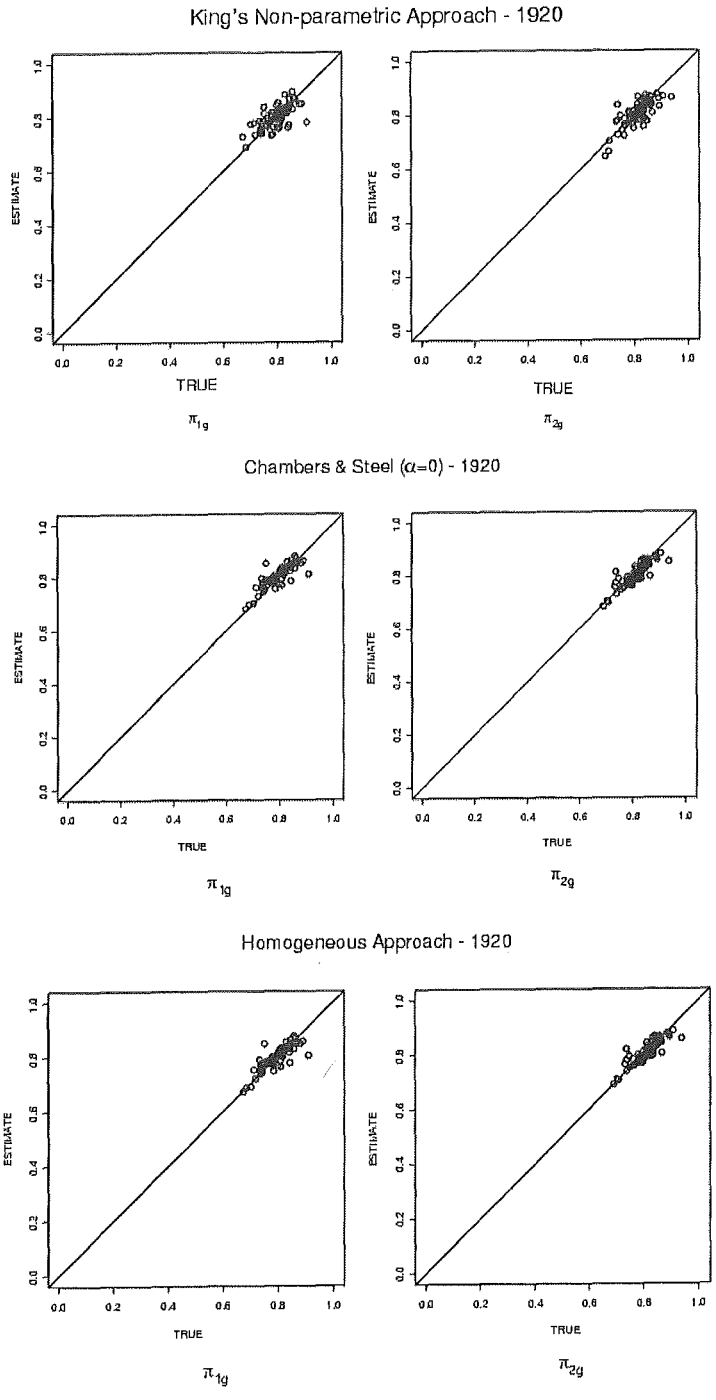

Figure 4.32 Estimates and True Values , Turnout December 1919

Chapter 5
Estimates of Men's and Women's Voting Behaviour Using King's Non-Parametric Method for Ecological Inference

In this chapter I apply King's non-parametric method to electorate data in order to produce estimates of women's and men's party votes and men's and women's prohibition votes. Ecological inference offers a major advance over other methods of inferring men's and women's voting behaviour. Such methods allow the estimation of men's and women's voting preferences at overall and electorate levels by making assumptions to compensate for loss of information caused by aggregation. Estimates allow the investigation of the relationship between gender and party and prohibition voting at the local and national levels. Did men and women vote differently?

There are two hypotheses for consideration, one regarding party voting, and the other regarding prohibition voting. The hypothesis regarding party vote is drawn from the patterns found in Christchurch in 1893. The analysis of that election campaign suggested that party preference was not polarized by gender. Men and women fell on both sides of the spectrum. Little work has been done on either the role of gender in party organization or the attempts of parties to appeal to men and women separately at later elections, but what work does exist, suggests that a similar pattern would apply. Existing work considers the role of women in the Labour Party. Women did join the that party, forming women's sections. Like the Liberal women in Christchurch, Labour women had to fight for influence within the party.[1] There has been no work on Liberal or Reform Party women's organizations, or the role of women in supporting opposition candidates. The invocation of gender in party platforms and policy is only beginning to be explored,[2] but it seems most likely that all parties continued to appeal to both men and women after 1893.

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[1] Liz Gordon, 'A Place in the Sun: Women in the New Zealand Labour Party' (1988), Unpublished manuscript; Melanie Nolan, 'Gender and the Politics of Keeping Left: Wellington Labour Women and Their Community, 1912-1949,' in *Communities of Women: Historical Perspectives*, ed. Barbara Brookes and Dorothy Page (Dunedin: University of Otago Press, 2002).

[2] Melanie Nolan, *Breadwinning: New Zealand Women and the State* (Christchurch: Canterbury University Press, 2000), pp.60-64,193-197.

Hence, the hypothesis regarding party voting is that party voting was not polarized by gender. However gender, that is understandings about sexual difference and the social organisation of that difference, may have influenced and modified partisan opinion according to the context. In particular, political organization and political debates shaped the way gender interacts with partisan opinion, and with other factors, such as rural-urban location, that influenced men's and women's voting. If this hypothesis is correct, men's and women's party preferences, and the difference between men's and women's party preferences, should differ across space. There should be variation in the electorate-specific estimates of men's and women's party voting preferences. However, large differences between men's and women's party preferences would not be predicted by the model, unless they could be explained by local factors. Variation in electorate estimates might translate to a significant difference overall, although a substantial difference between men's and women's overall party preferences would not be predicted by the hypothesis.

The hypothesis regarding prohibition voting is that women were more likely to support prohibition options. This hypothesis arises from claims that women had a special interest in prohibition made by suffragists in the 1890s, and by temperance workers promoting suffrage at prohibition polls. If this hypothesis is correct, then both electorate and overall estimates should show that women were more likely to support prohibition.

In this chapter, data from elections from 1893 until 1919 are considered, and estimates are produced for men's and women's preferences for Liberal, opposition and Reform candidates, and for the various prohibition options offered at the prohibition polls held over the period. Consideration of a number of elections allows the identification of patterns over time, and the estimates produced by King's non-parametric method suggest patterns that largely confirm existing accounts of party and prohibition voting between 1893 and 1919. However, the interpretation of election-specific and electorate-specific estimates is hindered by lack of research into the role of gender in election campaigns. The estimates do point to both turning point elections and unusual electorates where further research would inform our understanding of the interaction between gender and electoral politics in the early twentieth century.

Party Voting

The aim of this section is to estimate men's and women's electorate and overall votes for the Liberal party and their opposition, at first an unorganised collection of conservatives. The success of political parties during this period has been attributed to both political organization

and social change. The Liberal party first gained power in 1890, winning seats in both town and country. They remained in government until 1912, their superior party organization helping them beat their opponents, merely a loose grouping of conservatives in the early period. Bill Massey brought together opposition members of parliament from 1903 but it was not until after the 1908 election that this grouping officially became the Reform Party. By this time, the Liberal star was waning, and although the result of the 1911 election was not immediately clear, Reform eventually won a motion of confidence, forming a government in early 1912. Partisan politics were developing over this period which also saw the rise of the Labour Party. Its candidates won four seats in 1911. Michael Basset has noted that increasing urbanization underlay the changes. Politics was split along the urban-rural divide, with Reform mobilizing rural votes, and Labour doing better in urban areas. Country towns moved away from the Liberals, and the traditional Liberal coalition of town and country began to break down.[3] There were too few Labour candidates to allow estimation of men's and women's Labour votes in the period before 1919, but it is possible to run estimations of men's and women's electorate votes for Liberal, opposition and Reform candidates.

A number of factors make estimation of party voting difficult. Firstly, the gender balance in the electorates does not vary much, limiting the amount of information from which to form estimates. The extent of information loss due to aggregation is reflected in high inflation factors, and large standard errors on estimates. Secondly, unpacking party, and also prohibition votes by gender simplifies the complex processes of voting where a number of factors shape voting choice. Electorate factors like incumbency and the nature of the election campaign can make outcomes quite different across electorates. Analysts have suggested that dividing data-sets into like sub-groups can improve estimates,[4] but the limited number of electorates prevents such a division here. Electorates that had two or more candidates for the same party are, however, excluded from the analysis and for the purposes of estimation, the complexity of multiple candidate elections is simplified into two-by two tables like that shown in the previous chapter and in Table 5.1 below. In the early period, the looseness of Liberal organization meant there were a number of electorates with more than one Liberal candidate standing in an electorate. In 1893, 25 out of the 57 contested electorates had more than one Liberal candidate. The looseness of the opposition meant there could also be more

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[3] Michael Bassett, *Three Party Politics in New Zealand, 1911-1931* (Auckland: Historical Publications, 1982).See also David Hamer, *New Zealand Liberals: The Years of Power* (Auckland: Auckland University Press, 1988).

[4] For example Kent Redding and David R. James, 'Estimating Levels and Modeling Determinants of Black and White Voter Turnout in the South, 1880-1912,' *Historical Methods* 34, no. 4 (2001).

than one conservative candidate in an electorate. Excluding these electorates with duplicate party candidates effectively excludes the urban electorates from the analysis and limits the number of electorates that can be included in the analysis.[5] Few co-variates are available to add to the model, but, as for turnout, including known co-variates such as the rural population proportion or average population shift made little difference to the model.

Since it was the 1893 Christchurch election campaign that was considered in detail in Chapter Two, the estimates for men's and women's party voting at that election are considered in detail before considering later elections.

1893 Liberal Voting

Consider 32 electorates with one Liberal candidate at the election of 1893, and recall the contingency table for party voting in the Riccarton electorate in 1893 given in the previous chapter and reproduced as Table 5.1.

Table 5.1 Party Voting in the Riccarton Electorate, 1893

Riccarton, 1893	Liberal (Russell)	Other candidates (Boag, opposition)	Total
Women	v_{flj} β_{bj}	v_{foj} $1-\beta_{bj}$	v_{fj} =1417 x_j = 0.4839
Men	v_{mlj} β_{wj}	v_{moj} $1-\beta_{wj}$	v_{mj} =1511
Total	v_{jl} =1517 t_j = 0.5181	v_{oj} =1411	2928

The known quantities are:

v_{fj} = number of women who voted;

x_j = proportion of votes cast by women= $v_{fj} / (v_{fj} + v_{mj})$;

v_{mj} = number of men who voted;

v_{lj} = number of votes cast for the Liberal candidate;

v_{oj} = number of votes cast for other candidates;

t_j = proportion of votes cast for the Liberal candidate = $v_l /(v_l + v_o)$.

[5] Ideally the analysis would only include electorates with one Liberal and one opposition candidate. This would have limited the number of electorates in the analysis to less than 20.

The unknown quantities are:

v_{flj} = number of votes cast by women for the Liberal candidate;

β_{bj} = proportion of women who voted Liberal = $v_{flj} / v_{fj;}$;

v_{mlj} = number of votes cast by men for the Liberal candidate;

β_{wj} = proportion of men who voted Liberal = $v_{mlj} / v_{mj;}$;

v_{foj} = number of votes cast by women for other candidates;

$1- \beta_{bj}$ = proportion of women who voted for other candidates = $v_{foj} / v_{fj;}$;

v_{moj} = number of votes cast by men for other candidates;

$1- \beta_{wj}$ = proportion of men who voted for other candidates = $v_{moj} / v_{mj.}$.

The unknowns of interest are women's votes, $\beta_{bj,}$ and men's votes, $\beta_{wj,}$ for the Liberal candidate respectively, and their aggregates β_b and β_w. These are proportions: β_b is the proportion of women who cast a vote that chose the Liberal candidate in the 32 electorates, and β_w is the proportion of men who cast a vote that chose the Liberal Candidate. β_b can be interpreted as women's preference for Liberal candidates across electorates, and β_w can be interpreted as men's preference for Liberal candidates across electorates.

A review of this group of electorates in Chapter Four suggested there was some evidence of aggregation bias which might bias the results, and there were two outlying electorates that should be excluded. Known bounds are wide. The overall bounds are shown in Table 5.2. A high Palmquist inflation factor suggests regression based models including Goodman's ecological regression and King's parametric method would not perform well. Data describing turnout did show similar characteristics, but good estimates of men's and women's voting rates were produced by a number of methods for ecological inference, including King's non-parametric method. We would expect the non-parametric method to also perform well on data describing party voting, although of course since the true levels of men's and women's party votes are not known, the estimates cannot be compared with true values. Note that since the data on Liberal voting also exhibited signs of multiple modes, King's non-parametric method is particularly appropriate.

Table 5.2 Estimates of Women's and Men's Liberal Voting in 32 Electorates, 1893

1893 32 Electorates with one Liberal candidate. Palmquist Inflation Factor=69.4741	Women's Liberal Vote / Total Women's Vote	Standard Error	Men's Liberal Vote/ Total Men's Vote	Standard Error
Overall Bounds	(0.0271, 0.9532)		(0.1754, 0.7812)	
King's Parametric Estimates	0.7795	0.0394	0.2890	0.0258
King's Non-parametric Estimates	0.5045	0.0537	0.4689	0.0351

The overall estimates produced by King's parametric and non-parametric methods for women's and men's Liberal voting in 32 electorates with one Liberal candidate are shown in Table 5.2. Standard errors of overall estimates are also listed here. Excluding the outliers did not substantially change the estimates, as shown in Table 5.3, but the standard errors are reduced, suggesting less uncertainty. It is the estimates from the smaller set of electorates that are considered in the discussion that follows.

Table 5.3 Estimates of Women's and Men's Liberal Voting in 30 Electorates, 1893

1893 30 Electorates with one Liberal candidate. Palmquist Inflation Factor=71.1491	Women's Liberal Vote / Total Women's Vote	Standard Error	Men's Liberal Vote / Total Men's Vote	Standard Error
Overall Bounds	(0.0286, 0.9855)		(0.1883, 0.8214)	
King's Parametric Estimates	0.8070	0.0108	0.3069	0.0072
King's Non-parametric Estimates	0.5225	0.0412	0.4959	0.0274

Trials suggested that King's parametric estimates would be unreasonable, and this is borne out by the results shown in Table 5.3. The estimates produced by the parametric method suggest a large difference between women's and men's votes for Liberal candidates, with 81% of women in the 30 electorates apparently supporting their Liberal candidate, but only 31% of men supporting Liberals. The review of the Christchurch campaign suggests this was unlikely to be the case. There was no evidence of such large difference between men's and women's partisan opinions in 1893. Women and men expressed opinions on all sides of the political spectrum and supported candidates with a range of views through candidate committees for example.

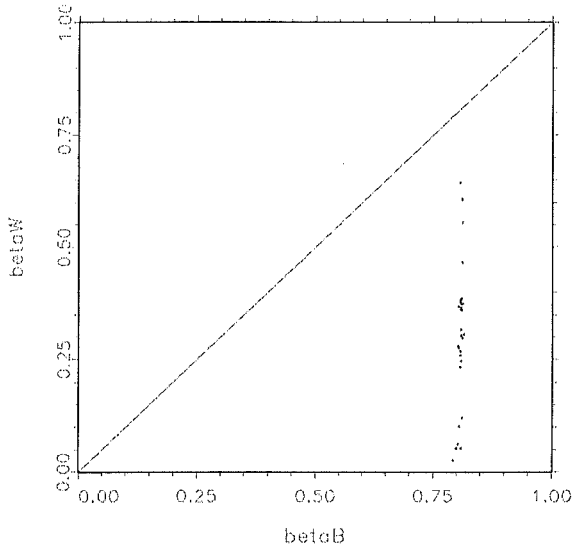

Figure 5.1 Parametric Estimates of Liberal Voting for 30 Electorates in 1893 (Women's Liberal Vote / Women's Vote (β_{bj}) against Men's Liberal Vote / Men's Vote (β_{wj}).)

Examination of the graphical diagnostics produced to support King's parametric method confirm the hunch that the parametric estimates are implausible, and that the method does not perform well with the data. In particular, the estimates of women's Liberal vote hardly vary between electorates. Similar uniformity occurred when using the King's parametric method to estimate men's and women's turnout in 1893. Consider the graph in Figure 5.1. In this graph, estimates of women's Liberal preference are plotted on the x-axis, and estimates of men's Liberal preference are plotted on the y-axis. Each point represents an electorate. If women's preference for the Liberals was equal to men's, the estimates would fall on the diagonal line. In fact they fall below the diagonal line, indicating that women's Liberal preference was apparently higher than men's. However, the graph also shows that the estimates of women's Liberal preference are approximately the same, 0.80, for every electorate. Hence the points lie in a vertical line on the graph. The parametric estimates suggest that women's preference for the Liberals was the same across electorates, while men's varied. This is clearly unlikely, and the parametric model unsuitable in this instance.[6] Parametric estimates of women's party vote at later elections exhibited similar problems, and I do not consider results from King's parametric method in the remainder of this chapter, but focus on the better performing non-parametric method.

[6] Note that, as for turnout, adjustments to the model such as including co-variates did not improve the variation amongst electorate estimates of women's Liberal preference.

The diagnostics suggest that the non-parametric estimates are more reasonable, although they are still uncertain, as reflected by the standard errors reported in Table 5.3. There was also some evidence that mean independence did not hold. This problem occurred with non-parametric estimates of party and prohibition voting at most elections. Further research is needed to determine how the non-parametric method performs when mean independence does not hold. However, despite evidence of similar aggregation bias amongst the estimates of turnout considered in the previous chapter, the estimates of men's and women's turnout remained reasonable.

The overall non-parametric estimates suggest that women's Liberal vote exceeded men's by three to four percentage points. The estimates suggest that 53% of women in the 32 electorates supported the Liberal candidate, while only 50% of men did so. To make this difference concrete, the estimates can be converted to votes. The estimates suggest that 19288 women voted for Liberal candidates out of the 36914 women that cast a vote in the 30 electorates, and that 27557 men out of 55570 voted Liberal. A majority of women apparently supported Liberals, while men's Liberal voting fell just short of a majority. The difference was significant with significance level set at 0.05: At 62.8135, the chi-square test had associated p-value <0.0001, less than 0.05, enabling the rejection of the null hypothesis which was that there was no difference between men's and women's voting, The alternative hypothesis can be accepted: preference for the Liberals differed by gender.

The electorate estimates, listed in Table 5.4, present a more complex picture. In some electorates, such as Riccarton, men's preference exceeded women's preference for the Liberals. The estimates suggest that in Riccarton 57% of men supported the Liberal candidate, G. W. Russell, but only 47% of women. In other electorates, such as Kaiapoi, women were apparently more likely to support the Liberal candidate than men. In Kaiapoi, 56% of women apparently supported the Liberal candidate, but only 48% of men.

Figure 5.2 shows the tomography plot, with non-parametric electorate estimates marked on the relevant tomography line. Each line on the graph corresponds to an electorate. The unknown values for men's and women's Liberal voting must lie on the appropriate line for each electorate. The point on each line represents the non-parametric estimate of those unknowns in each electorate. The diagonal line that crosses the graph is the y = x line,

Table 5.4 Non-Parametric Estimates of Men's and Women's Liberal Votes in 30 electorates in 1893

Electorate	Winning Party	Number Candidates	Liberal Votes/ Total Votes cast (Known)	Liberal Votes (Known)	Women's Liberal Votes / Women's Votes Non-Parametric Estimate	Women's Liberal Votes Non-Parametric Estimate	Men's Liberal Votes/ Men's Votes Non-Parametric Estimate	Men's Liberal Votes Non-Parametric Estimate	Chi-square	Significance
Buller	Liberal	2	0.531	1817	0.5299	680	0.5317	1136	0.0128	0.91
Clutha	Opposition	2	0.366	1139	0.6096	712	0.2192	426	478.6732	<0.0001
Ellesmere	Liberal	2	0.551	1576	0.5222	609	0.5708	966	6.5069	0.0107
Franklin	Liberal	2	0.514	1684	0.4798	711	0.5422	975	12.5727	0.0004
Invercargill	Liberal	2	0.672	2423	0.6826	1125	0.663	1297	1.5522	0.2128
Kaiapoi	Liberal	2	0.514	1587	0.5643	733	0.4774	854	22.6151	<0.0001
Marsden	Liberal	2	0.674	1955	0.4101	395	0.8051	1559	455.8483	<0.0001
Napier	Liberal	2	0.57	2114	0.55	913	0.5863	1201	4.9637	0.0259
Otaki	Opposition	2	0.46	1135	0.5322	408	0.4274	726	23.174	<0.0001
Pareora	Liberal	2	0.537	1594	0.5265	617	0.5438	979	0.8236	0.3641
Parnell	Liberal	2	0.551	1800	0.5969	1012	0.5015	788	30.0322	<0.0001
Patea	Opposition	2	0.372	979	0.5702	548	0.2581	431	254.3958	<0.0001
Rangitikei	Liberal	2	0.522	2100	0.5147	697	0.5257	1403	0.4578	0.4987
Riccarton	Liberal	2	0.518	1517	0.4647	658	0.568	858	31.3573	<0.0001
Selwyn	Liberal	2	0.548	1335	0.5268	530	0.5629	806	3.0934	0.0786
Taieri	Liberal	2	0.514	1400	0.5469	611	0.4911	789	8.2796	0.004
Waihemo	Liberal	2	0.55	1796	0.5008	635	0.5812	1163	20.075	<0.0001
Waipa	Opposition	2	0.329	952	0.4745	509	0.2432	443	163.0973	<0.0001
Waitaki	Liberal	2	0.707	1816	0.6034	600	0.7724	1217	83.6317	<0.0001
Waitemata	Opposition	2	0.462	1446	0.5391	607	0.4186	839	42.2109	<0.0001
Wallace	Liberal	2	0.576	1637	0.4332	392	0.6429	1244	111.653	<0.0001
Avon	Liberal	3	0.539	1719	0.5364	774	0.5411	945	0.0657	0.7977
Caversham	Liberal	3	0.517	1335	0.4243	542	0.6079	793	86.7772	<0.0001
Inangahua	Independent	3	0.293	843	0.5152	472	0.1894	372	320.498	<0.0001
New Plymouth	Liberal	3	0.551	1782	0.5247	676	0.5684	1107	6.1048	0.0135
Palmerston	Liberal	3	0.473	1745	0.495	714	0.4589	1030	4.5157	0.0336
Waipawa	Liberal	3	0.507	2024	0.5451	708	0.4886	1314	11.2109	0.0008
Wakatipu	Independent	3	0.298	862	0.5209	481	0.1936	381	321.7864	<0.0001
Manukau	Liberal	4	0.402	1126	0.3957	545	0.408	582	0.4442	0.5051
Oamaru	Liberal	4	0.518	1611	0.4744	675	0.5549	935	20.0465	<0.0001

The null hypothesis for the chi-square test is that there was no difference between men's and women's support for the Liberals (i.e. $\beta_{bj} = \beta_{wj}$). The alternative hypothesis states that there was a difference (i.e. $\beta_{bj} = \beta_{wj}$). The null hypothesis can be rejected if chi-square values are significant, which is here taken to hold if the p-values are less than 0.05.

This plot also shows the relationship between the electorate estimates for women's Liberal voting (β_{bj}) and men's Liberal voting (β_{wj}). The electorate estimates are randomly scattered around the central y = x line, revealing no clear relationship between the estimates of men's and women's Liberal voting in the 30 electorates. For electorates where points fall above the line, such as Riccarton, men's preference for the Liberals apparently exceeded women's. For other electorates where estimates fall below the y = x line, women's preference for the Liberal candidate exceeded women's.

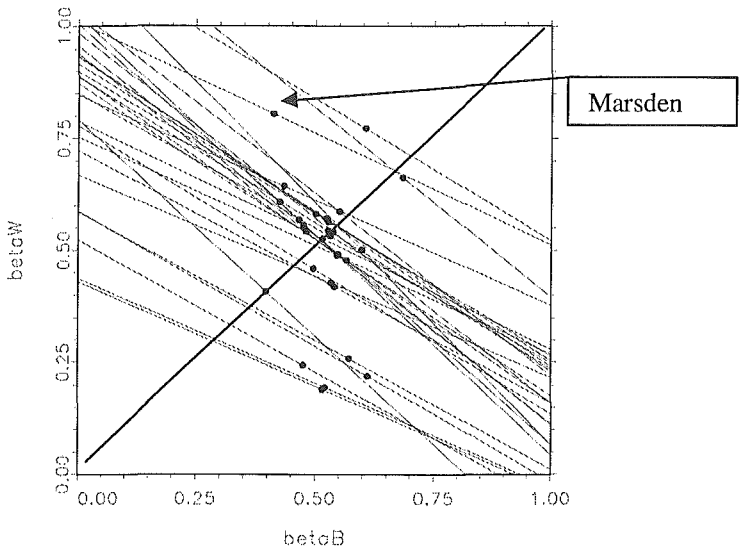

Figure 5.2 Tomography Plot for Liberal Voting, 1893, showing Non-Parametric Electorate Estimates (Women's Liberal Vote / Total Women's Vote (β_{bj}) against Men's Liberal Vote / Total Men's Vote (β_{wj}))

Figure 5.2 helps show how the parametric method works, and reveals some of the more unusual results. Electorate estimates for a particular electorate are determined by where that electorate's tomography line crosses other tomography lines. Take Marsden for example. Its tomography line crosses three other tomography lines. The point estimate for Marsden lies on its tomography line, between the points of intersection with other lines.

The estimate for the Marsden electorate indicates a highly polarised result. It is far from the diagonal y = x line, and the estimates suggest that 41% of women supported the Liberal candidate, but 81% of men supported the Liberals. In most electorates the difference between men's and women's Liberal vote was less than 10 percentage points, but in some electorates, the estimates present substantial differences. With the exception of Marsden, these electorates lie at the bottom of the tomography plot and form a distinct group. These electorates were Clutha, Patea, Waipa, Inangahua and Wakatipu. Liberals won none of these electorates, and

the Liberal candidates won few votes. Hence values for the Liberal vote, t_j were low for all of these electorates. These electorates form a separate group from the other electorates. Data-sets that have a number of identifiable sub-groups, like this one, are said to exhibit multi-modality. The non-parametric method is designed for use with data-sets that exhibit multimodality since estimates are calculated by sharing most information between electorates with tomography lines that are close on the tomography plot, so the inclusion of the five electorates should not much influence the estimates for other electorates. However, those five electorates do influence the overall estimates. Recalculating those overall estimates by excluding Clutha, Patea, Waipa, Inangahua and Wakatipu, the non-parametric estimates suggest that, across 25 electorates, 52% of women voted for Liberal candidates, and 55% of men. Overall, in those 25 electorates, men were more likely to support Liberal candidates than women.

This suggests a different conclusion from the overall estimates for all 30 electorates. The apparently opposing result reflects the way that overall estimates are calculated in the non-parametric method and many other methods for ecological inference. Overall estimates are made up of the electorate estimates. They are calculated by taking the weighted mean. Hence unusual estimates can have a large impact on the overall estimates, particularly in a small data-set like this one. This suggests that overall estimates can be of less value than individual estimates, especially in small data-sets. It is also true that overall vote counts do not necessarily reflect election results. The proportion of seats a party held in parliament did not always corresponded to the proportion of votes that party received at New Zealand elections run under the first past the post political system. For example, Labour won the 1935 election gaining 53 of the non-Māori seats. This was 70% of the 76 seats available, but Labour had only collected 46% of the total number of votes cast.[8] The relationship between the overall estimates and the electorate estimates for men's and women's party votes is similar. A significant pattern may be evident on the large scale, but there is much variation on the small scale.

Consider the electorate estimates listed in Table 5.4. In seventeen of the 30 electorates, men's preference for Liberal candidates exceeded that of women, and in the remaining thirteen electorates, women's preference for Liberal candidates exceeded that of men. The chi-square values listed in Table 5.4 indicate that differences were significant in all but seven of the

[8] Neill Atkinson, *Adventures in Democracy: A History of the Vote in New Zealand* (Dunedin: Otago University Press, 2003), pp.145-147.

electorates.[9] When significance is taken into account, the estimates suggest that women's preference for the Liberal candidate exceeded men's in twelve electorates, and men were more likely than women to support the Liberal candidate in eleven electorates. Overall, these results suggest that was no consistent relationship between gender and Liberal voting, but that the relationship between gender and partisanship differed in different contests and contexts.

Some results confirm the analysis in Chapter Two which emphasised the importance of the election campaign. Take Riccarton for example. The estimates suggest that women were more likely to support the opposition candidate, William Boag. Boag's wife and ladies' committee had canvassed hard to win women's votes. Caversham estimates also suggest that women preferred candidates other than the Liberal candidate. The local Liberal organization, the Workers' Political Committee, had refused to consider the input of women's organizations, and perhaps this lowered women's Liberal vote in the electorate. Variation in electorate estimates supports the hypothesis that the party preferences of men and women were influenced by the way gender threaded through the organisation and rhetoric of local election campaigns. Gender interacted with other factors to produce partisan opinion.

When the electorate estimates are examined in detail, they suggest that women's presence at the polls did not make much difference to the overall result. However, if men had stayed at home, and women alone had voted, the winning candidate might have been different in a number of electorates.

Consider the estimates for electorates with two candidates of which there were 21, listed in Table 5.4. In just two of these electorates, Kaiapoi and Taieri, Liberal wins would have been reversed if women had stayed home. For example, in Kaiapoi, 56% of women apparently supported the Liberal candidate, but just 48% of men. If men had stayed home, the estimates suggest that for eight of the two way contests the results would have changed. In four electorates, a Liberal seat would have been taken instead by their opponent. Liberal candidates in Franklin, Marsden, Riccarton and Wallace apparently won over 50% of men's votes, but less than 50% of women's votes. In another four electorates, Clutha, Otaki, Patea

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[9] Here the null hypothesis is that there was no difference between men's and women's support for the Liberals. The alternative hypothesis states that there was a difference. The null hypothesis can be rejected if chi-square values are significant, which is here taken to hold if the p-values are less than 0.05. The seven electorates where the chi-square statistic was not significant, as listed in Table 5.4, were Buller, Invercargill, Pareora, Rangitikei, Selwyn, Avon and Manukau. In these electorates, there is not enough evidence to reject the null hypothesis.

and Waitemata, the Liberal candidate would have beaten the opposition without men's votes, taking the seat, and reversing the result.

The claim that Liberals appealed across different sectors is also confirmed by the results. Commentators had suggested that there might be differences between the electoral behaviour of rural and urban men and women at the 1893 election. There was no apparent relationship between overall Liberal voting in 1893 and the rural population proportion as noted in Chapter Four (Figure 4.7). Figure 5.3 shows that women's support for the Liberals varied across more and less rural electorates, with great variation amongst all-rural electorates. The graph shows no particular relationship between the rural population proportion and women's Liberal voting. Figure 5.4 shows the estimates of women's Liberal preference against the average annual population shift. Again, there is no relationship between women's apparent Liberal support and shifts in population. Estimates for men's Liberal voting present similar graphs. The estimates suggest that Liberal support varied across sections, with no particular pattern.

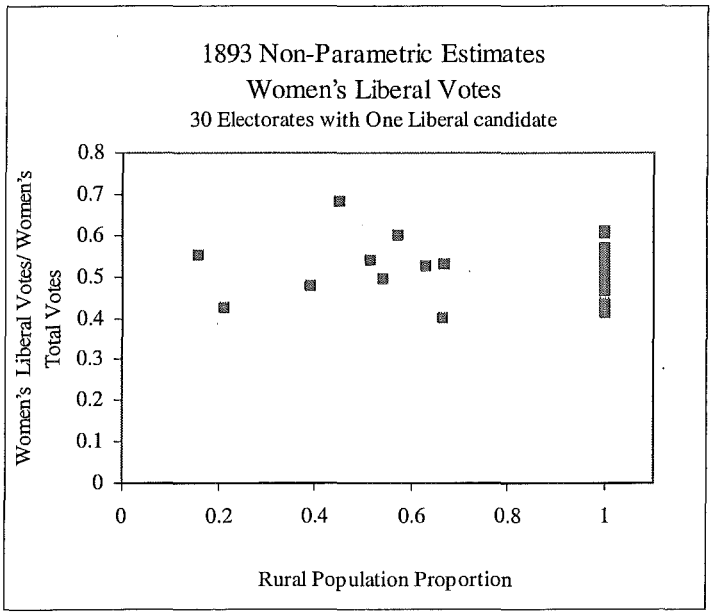

Figure 5.3 Non-Parametric Estimates of Women's Liberal Voting against Rural Population Proportion for 30 Electorates in 1893

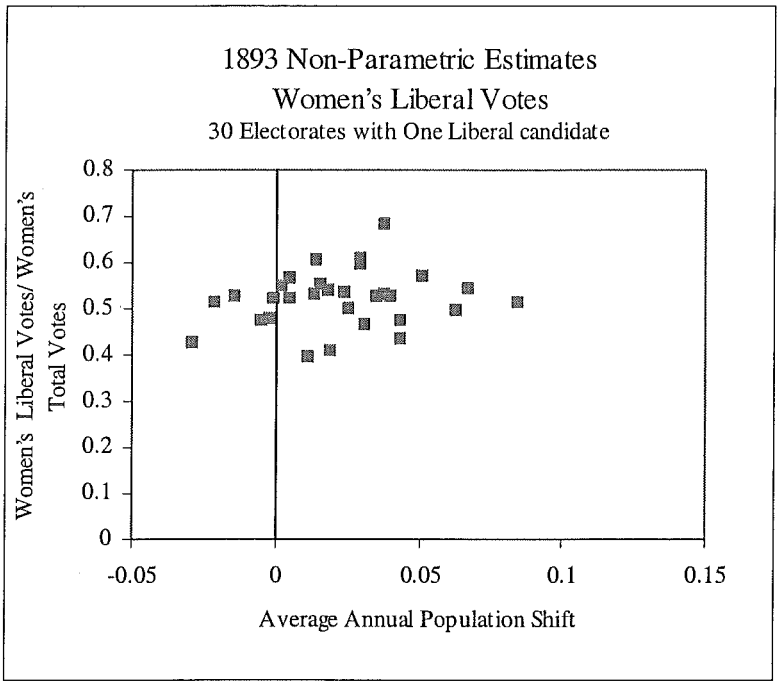

Figure 5.4 Non-Parametric Estimates of Women's Liberal Voting against Average Annual Population Shift for 30 Electorates in 1893

While further investigation is needed to confirm this claim, the lack of relationship between structural variables like the rural population proportion and the average annual population shift suggest that men's and women's voting preferences were influenced by election campaigns. Overall, the estimates for Liberal voting suggest that at the 1893 election, partisan preference was not independent of gender, but dependent on it. Men and women had different party preferences. However, the exact difference varied across space.

1893 Opposition Voting

Estimates of men's and women's votes for the opposition candidate give a similar picture. The overall estimates suggest that women were more likely than men to vote for opposition candidates in 1893, but there was a great deal of variation at electorate level. However, in most electorates, the estimates suggest women's support of opposition candidates exceeded men's.

Consider the non-parametric estimates of opposition voting in electorates with one opposition candidate. This data-set is similar to those already considered, and contingency tables set votes for the opposition candidate against votes for all other candidates standing in the electorate. The marginal frequencies do not substantially narrow the possibilities for the

unknowns, and the known bounds on electorate and overall estimates are wide. Overall bounds are shown in Table 5.5.

Table 5.5 Estimates of Men's and Women's Opposition Voting in 35 electorates, 1893

1893 35 electorates with one opposition Candidate.[9] Palmquist Inflation Factor=58.8946	Women's Opposition Vote / Women's Total Vote	Standard Error	Men's Opposition Vote/ Men's Total Vote	Standard Error
Overall Bounds	(0.0037, 0.9289)		(0.1238, 0.7030)	
King's Non-parametric Estimates	0.4605	0.0464	0.4170	0.0291

Overall non-parametric estimates are shown in Table 5.5. They suggest that women's support for opposition candidates exceeded that of men across the 35 electorates. At 46%, a substantial minority of women supported opposition candidates. Forty one percent of men supported opposition candidates. The difference was significant, with chi-square statistic of 197.0992 and p-value <0.0001.[10]

Again the electorate estimates give a mixed picture, confirming the hypotheses that partisan voting was not consistently polarized by gender, and that the context was important. The electorate specific non-parametric estimates of opposition voting are listed in Table 5.6. The chi-square statistics, also listed, indicate that in 30 of the 35 electorates, there was a significant difference between men's and women's preferences for opposition candidates. In Napier, Pareora, Rangitikei, Avon and Waikouaiti the chi-square statistics was not significant, suggesting that in those electorates, women's and men's preference for the opposition candidates were about the same.

Figure 5.5 shows the electorate estimates on the tomography plot. Each line corresponds to an electorate, and the point on the line represents the estimate for that electorate.

[9] Excludes the outlier of Caversham.

[10] Here the null hypothesis is that there was no difference between men's and women's preference for opposition candidates, and the alternative hypothesis is that there is a difference between men's and women's preference for opposition candidates. The significance level is set at 0.05.

Table 5.6 Non-Parametric Estimates of Men's and Women's Opposition Voting in 35 Electorates in 1893

Electorate	Winning Party	Number Candidates	Opposition Votes / Total Votes	Opposition Votes	Women's Opposition Votes / Women's Votes Non-Parametric Estimate	Women's Opposition Votes Non-Parametric Estimate	Men's Opposition votes / Men's Votes Non-Parametric Estimate	Men's Opposition Votes Non-Parametric Estimate	Chi-Square	Significance
Clutha	Opposition	2	0.634	1971	0.5272	616	0.6984	1356	91.7576	<0.0001
Ellesmere	Liberal	2	0.449	1283	0.4891	570	0.4213	713	12.7946	0.0003
Franklin	Liberal	2	0.486	1595	0.5282	782	0.4512	811	19.2574	<0.0001
Kaiapoi	Liberal	2	0.486	1500	0.5261	683	0.4569	817	14.2792	0.0002
Napier	Liberal	2	0.43	1594	0.4145	688	0.4426	906	2.9172	0.0876
Otaki	Opposition	2	0.54	1330	0.3927	301	0.6065	1030	97.5500	<0.0001
Pareora	Liberal	2	0.463	1377	0.459	537	0.4656	838	0.1388	0.7095
Parnell	Liberal	2	0.449	1466	0.4101	695	0.4909	771	21.4853	<0.0001
Patea	Opposition	2	0.628	1652	0.5066	487	0.6978	1165	95.0849	<0.0001
Rangitikei	Liberal	2	0.478	1924	0.4904	664	0.4717	1259	1.2095	0.2714
Riccarton	Liberal	2	0.482	1411	0.5498	779	0.4184	632	50.6358	<0.0001
Selwyn	Liberal	2	0.452	1103	0.5613	565	0.3751	537	83.0903	<0.0001
Taieri	Liberal	2	0.486	1324	0.5503	615	0.4413	709	31.5640	<0.0001
Waihemo	Liberal	2	0.45	1472	0.4845	614	0.4281	857	9.9431	0.0016
Waipa	Opposition	2	0.671	1941	0.5668	608	0.7325	1333	84.0295	<0.0001
Waitemata	Opposition	2	0.538	1685	0.4415	497	0.5923	1188	66.2655	<0.0001
Wallace	Liberal	2	0.424	1204	0.5212	472	0.3784	732	51.4413	<0.0001

Electorate	Winning Party	Number Candidates	Opposition Votes / Total votes	Opposition Votes	Women's Opposition Votes / Women's Votes Non-Parametric Estimate	Women's Opposition Votes Non-Parametric Estimate	Men's Opposition votes / Men's Votes Non-Parametric Estimate	Men's Opposition Votes Non-Parametric Estimate	Chi-Square	Significance
Ashley	Liberal	3	0.38	1078	0.4924	528	0.3117	550	92.2351	<0.0001
Avon	Liberal	3	0.127	405	0.1288	186	0.1256	219	0.0894	0.7650
Bay of Islands	Liberal	3	0.396	1200	0.5408	448	0.3416	752	100.1806	<0.0001
Eden	Opposition	3	0.43	1515	0.4819	757	0.3882	757	31.1352	<0.0001
Egmont	Independent	3	0.438	1170	0.4695	377	0.4244	792	4.6771	0.0306
Hawke's Bay	Opposition	3	0.382	1374	0.5132	481	0.3356	893	92.1208	<0.0001
Masterton	Liberal	3	0.28	1054	0.5065	614	0.1724	440	455.1995	<0.0001
Mataura	Liberal	3	0.421	1296	0.4787	475	0.3936	822	19.7924	<0.0001
Palmerston	Liberal	3	0.418	1542	0.494	713	0.3692	828	56.5226	<0.0001
Waimea Sounds	Liberal	3	0.125	249	0.1923	120	0.0943	129	37.9953	<0.0001
Waipawa	Liberal	3	0.413	1646	0.5136	667	0.3643	980	80.3984	<0.0001
Wairarapa	Opposition	3	0.509	1806	0.4614	606	0.5369	1201	18.9089	<0.0001
Wanganui	Unknown	3	0.42	1472	0.4501	654	0.3986	817	9.1757	0.0025
City of Nelson	Liberal	4	0.326	1012	0.2886	425	0.3598	653	18.8297	<0.0001
Manukau	Liberal	4	0.312	874	0.2313	319	0.3899	556	81.6935	<0.0001
Rangitata	Liberal	4	0.435	1114	0.5784	554	0.3493	560	127.5974	<0.0001
Waikouaiti	Opposition	4	0.479	1049	0.4683	444	0.4872	604	0.7562	0.3845
Bay of Plenty	Liberal	6	0.336	953	0.5129	514	0.2391	438	217.1824	<0.0001

The null hypothesis for the chi-square test is that there was no difference between men's and women's support for the opposition (i.e. $\beta_{bj} = \beta_{wj}$). The alternative hypothesis states that there was a difference (i.e. $\beta_{bj} \neq \beta_{wj}$). The null hypothesis can be rejected if chi-square values are significant, which is here taken to hold if the p-values are less than 0.05.

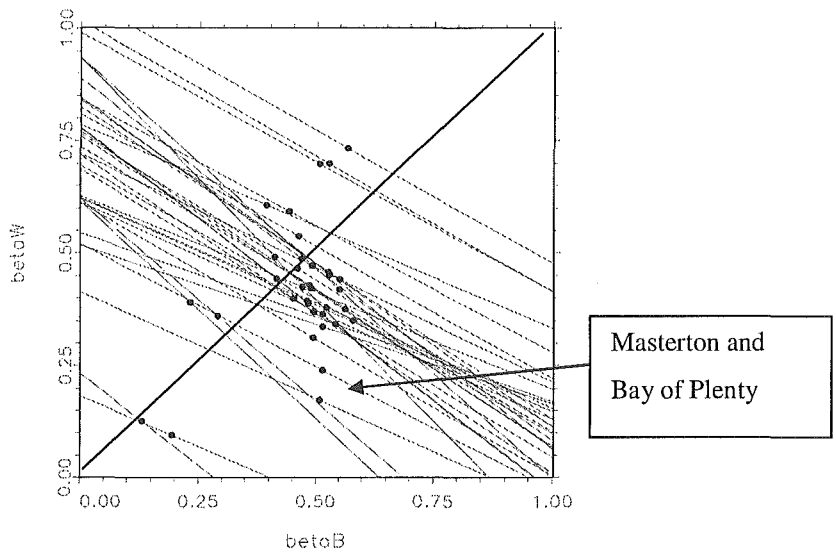

Figure 5.5 Tomography Plot for Opposition Voting, 1893, showing Non-Parametric Electorate Estimates (Women's Opposition Vote / Total Women's Vote (β_{bj}) against Men's Opposition Vote / Total Men's Vote (β_{wj}))

This time, there are fewer highly polarised electorates. Masterton and Bay of Plenty had the most polarised results. In both those electorates, over half of women apparently supported the opposition candidate, but less than a quarter of men. The overall estimates were little affected by these electorates. Excluding them and recalculating the overall estimates gave similar estimates to those in Table 5.5, namely 46% and 43% for women's and men's Liberal voting.

The electorate estimates for opposition voting also more closely resemble the overall estimates than electorate estimates of Liberal voting did. Excluding the five electorates where the chi-square statistic indicated no significant difference between men's and women's opposition support,[11] the estimates suggest that in 21 of the remaining 30 electorates, women were more likely to support the opposition candidate than men were. This is clear in Figure 5.5 which shows that most estimates lie below the diagonal y = x line. Hence, although the electorate estimates do reflect variation in men's and women's support for the Liberals, they provide good evidence that women voters were more likely to support the opposition than men across the 35 electorates.

The conservative advocate of women's suffrage, Sir John Hall, hoped that women would support opposition candidates. However, the figures suggest that Hall's hopes were only partially fulfilled since they suggest that while women were more likely to support opposition

[11] That is, excluding Napier, Pareora, Rangitikei, Avon and Waikouaiti.

candidates than men, it was only a substantial minority of women (and men) who preferred the opposition candidates. Again, further research at electorate level is needed to determine why women would be more likely than men to support the opposition. The cry of Mrs Packe and Miss Torlesse for quality candidates with integrity may have resonated with women in a number of electorates. Conservative women's enthusiasm for opposition candidates may also have found more room for expression in electorates where there were opposition candidates with higher public profiles than those of Christchurch conservative candidates. There, opposition candidates either had little profile, like Mortimer Davie or were clearly not respected, like Eden George. In the Riccarton electorate, the opposition candidate, William Boag, was able mobilise a number of women to join his ladies committee.

Unfortunately for opposition candidates, the problem was, that as with Liberal voting, women's votes did not make much difference to the overall result. There were seventeen two way contests with one opposition candidate. If men alone had voted in these electorates, the end results would not have changed, but these estimates do suggest that if men had stayed home, there would have been more opposition wins. In six seats, Franklin, Kaiapoi, Riccarton, Selwyn, Taieri and Wallace, the Liberal victory would have been replaced by an opposition win. In Otaki and Waitemata, the winning Opposition member would have lost to his opponent. In some electorates at least, women provided some support to opposition candidates.

Taken together, the estimates for Liberal and Opposition voting suggest that men's and women's votes differed at electorate level. The estimates for opposition voting suggest that women were more likely than men to support opposition candidates overall, although there were a number of electorates where men's support for the opposition exceeded women's. This result indicates that the hypothesis needs to be modified since there was a significant difference between men's and women's preferences for opposition candidates. According to the estimates, women were more likely than men to support opposition candidates in 35 electorates in 1893. Voting preference was polarized by gender.

The differences between women's and men's preferences for Liberal candidates were not so clear cut. The overall estimates suggested that women's preference for the Liberals significantly exceeded men's, but once a number of outliers were removed, the opposite pattern was suggested. There were almost equal numbers of electorates where women's support for the Liberal candidate significantly exceeded men's and electorates where men's support for the Liberals significantly exceeded women's.

Overall, however, the estimates suggest that women's votes did not change the outcome in most electorates. This is an interesting result, because it seems to go against the trend suggested by the estimates that women's and men's preferences were not generally the same. The best conclusion seems to be that voting by gender was complex, and not necessarily captured in election results.

One warning should be made about the electorate estimates of men's and women's party voting in 1893. Note that the estimates of Liberal and of opposition votes were made from different data-sets and different runs of the model. The process does not guarantee that estimates computed from different data-sets should match up, and they do not. Take Riccarton for example. The estimate of women's Liberal vote proportion is 0.4647, and the estimate of women's opposition vote, drawn from a different data-set and estimation process, is 0.5498. These estimates do not add to one. Of course, if they were the true proportions they would since Riccarton was a two way contest. Note however, that in most electorates, the estimates from the different processes do not contradict each other. In Riccarton, estimates from both processes suggest that women were more likely to support the opposition candidate, William Boag. Most men apparently supported Boag's Liberal opponent, G. W. Russell, who won the seat. For some electorates, the estimates are contradictory. Some commentators claimed that women in the Kaiapoi electorate had supported the supported the winning candidate, D. Buddo, a Liberal prohibitionist, because his opposition had apparently provided free whisky to voters, anathema to women who supported temperance.[13] The estimates for Liberal voting suggest that most women did support Buddo. However, the estimates of opposition voting suggest a majority of women favoured Buddo's opponent. Clearly the two estimates cannot both be correct.[14] Such contradictions are a reminder that the estimates are estimations.

1893 to 1919

Estimates for later elections follow a similar pattern to those from 1893. Non-parametric estimates are reasonable, but have large standard errors. As before, there is some evidence of that mean independence does not hold, which may bias the estimates. Overall estimates for men's and women's Liberal, opposition and Reform voting are shown in Table 5.7 and Table

[13] *Lyttelton Times*, 4 December 1893, p.2.

[14] Other contradictory estimates are those for Clutha, Patea, Selwyn, Taieri and Waitomo.

5.8. Electorate specific estimates of men's and women's party preferences at elections from 1896 to 1919 are shown in Appendix Two.[15]

Overall the differences are not large, but they are significant. Table 5.7 and Table 5.8 list chi-square statistics. The values of the chi-square statistics are significant (less than 0.05) with the one exception of the opposition vote in 1896. Hence the null hypothesis of no difference between men's and women's preference for Liberal candidates can be rejected for all years, and we can conclude that men's and women's preference for the Liberals differed between 1896 and 1919. Gender was a factor in Liberal support. With the exception of 1896, the same is true for men's and women's opposition and Reform support. There was a significant difference between men's and women's support for the opposition, except in 1896, and a significant difference between men's and women's support of Reform candidates. Gender was a factor in opposition and Reform support.

The direction of these differences is shown in Figure 5.6 and Figure 5.7. The estimates suggest differences between men's and women's party votes that are consistent over time, with a change in 1911. Figure 5.6 shows the estimates for men's and women's Liberal voting from 1893 until 1919. The non-parametric estimates suggest that women were more likely to vote for Liberal candidates in 1893, but from 1896 until 1905, men were more likely to vote for Liberal candidates than women were. The pattern shifted in 1908 when men's and women's Liberal votes were very similar. In 1911, men's vote for the Liberals exceeded women's, and in 1914 and 1919 women's vote for the Liberals exceeded men's. Both men's and women's Liberal votes were very low in 1911.

Estimates of overall opposition voting, shown in Figure 5.7, show essentially the reverse pattern. In 1893 women were more likely to support opposition candidates than men. In 1896 men and women had equal preferences for opposition candidates. After 1896 women were more likely to vote for opposition candidates than men once more. In 1908 and 1911 men's and women's propensities to vote for Massey's Reform party were very similar. In 1908 women were slightly more likely to support Reform than men. In 1911 men were more slightly likely to support Reform than women. From 1914, men's support for Reform candidates continued to exceed women's, although the difference was small in 1919.

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[15] Note that in 1908 and 1911 a slightly different electoral system was in place. If no candidate received more than half the votes cast, a second ballot was held a few weeks after the first, with only the top two polling candidates listed. For the purposes of this analysis, only the first ballot has been considered. Note also that, as in 1893, some electorates were excluded from analyses.

Table 5.7 Non-Parametric Estimates of Men's and Women's Votes for Liberal Candidates, in Electorates with one Liberal Candidate 1896 to 1919

Election	Number Electorates (Total Electorates contested)	Palmquist Inflation Factor	Total Liberal Vote	Women's Liberal Vote Non-Parametric Estimate	Standard Error	Men's Liberal Vote Non-Parametric Estimate	Standard Error	Overall Chi-Square	Significance
1896	46 (62)	57.5700	0.5066	0.4849	0.0414	0.5212	0.0279	206.6868	<0.0001
1899	41 (59)	88.3140	0.5360	0.5104	0.1707	0.5563	0.1232	280.6470	<0.0001
1902	40 (68)	87.7528	0.5770	0.5469	0.0373	0.5992	0.0274	448.1528	<0.0001
1905	59 (76)	79.3904	0.5298	0.5068	0.0347	0.5477	0.0268	505.5971	<0.0001
1908	43 (76)	66.7474	0.4795	0.4829	0.0354	0.477	0.0276	8.4391	0.0037
1911	62 (76)	69.2282	0.4047	0.3782	0.0267	0.427	0.0221	1001.3250	<0.0001
1914	64 (76)	75.1874	0.4920	0.5114	0.0346	0.4786	0.0273	455.9429	<0.0001
1919	54 (76)	103.9832	0.3839	0.3938	0.0332	0.3669	0.0295	295.5842	<0.0001

The null hypothesis for the chi-square test is that there was no difference between men's and women's support for Liberal candidates (i.e. $\beta_b = \beta_w$). The alternative hypothesis states that there was a difference (i.e. $\beta_b \neq \beta_w$). The null hypothesis can be rejected if chi-square values are significant, that is, less than 0.05.

Table 5.8 Non-Parametric Estimates of Men's and Women's Votes for Opposition Candidates until 1908 and Reform Candidates from 1911, in Electorates with one Opposition or Reform candidate, 1896 to 1919

Election	Number Electorates (Total Electorates contested)	Palmquist Inflation Factor	Total Opposition or Reform Vote	Women's Opposition or Reform Vote / Women's Vote Non-parametric Estimate	Standard Error	Men's Opposition or Reform Vote / Men's Vote Non-parametric Estimate	Standard Error	Overall Chi-Square	Significance
1896	48 (62)	68.6164	0.4563	0.4583	0.039	0.4549	0.0272	1.8734	0.1711
1899	45 (59)	107.5586	0.4114	0.4312	0.042	0.398	0.0287	192.2606	<0.0001
1902	35 (68)	100.4736	0.4521	0.4791	0.045	0.433	0.0321	287.7405	<0.0001
1905	54 (76)	85.4507	0.4174	0.4372	0.031	0.4021	0.024	245.9111	<0.0001
1908	46 (76)	70.8071	0.4145	0.4241	0.0351	0.4073	0.0272	71.5718	<0.0001
1911	64 (76)	63.0956	0.4201	0.4123	0.0358	0.4266	0.0294	84.9167	<0.0001
1914	72 (76)	76.0301	0.4640	0.4371	0.0303	0.486	0.025	1173.0753	<0.0001
1919	59 (76)	130.9858	0.4478	0.4445	0.0318	0.4507	0.0278	11.3546	0.0008

The null hypothesis for the chi-square test is that there was no difference between men's and women's support for the opposition or Reform (i.e. $\beta_b = \beta_w$). The alternative hypothesis states that there was a difference (i.e. $\beta_b \neq \beta_w$). The significance level is set at 0.05.

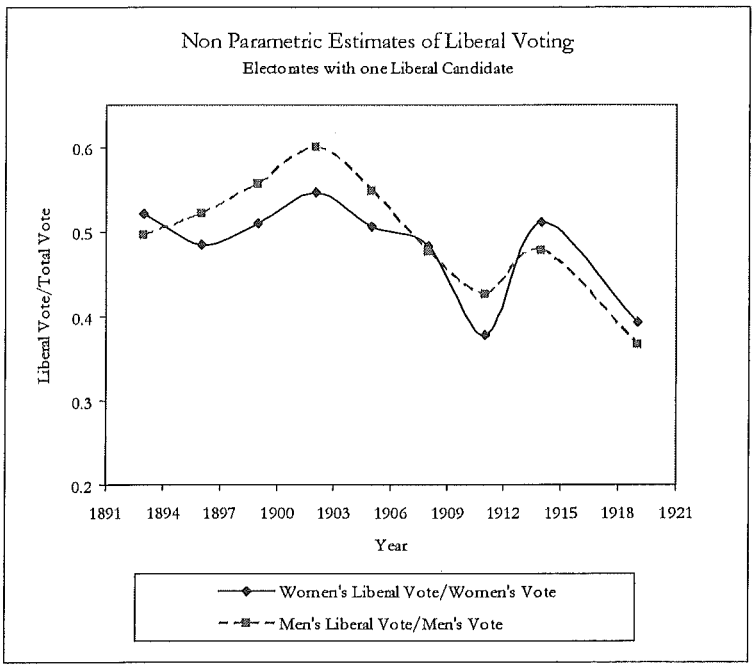

Figure 5.6 Non-Parametric Overall Estimates of Women's and Men's Liberal Voting 1893 to 1919

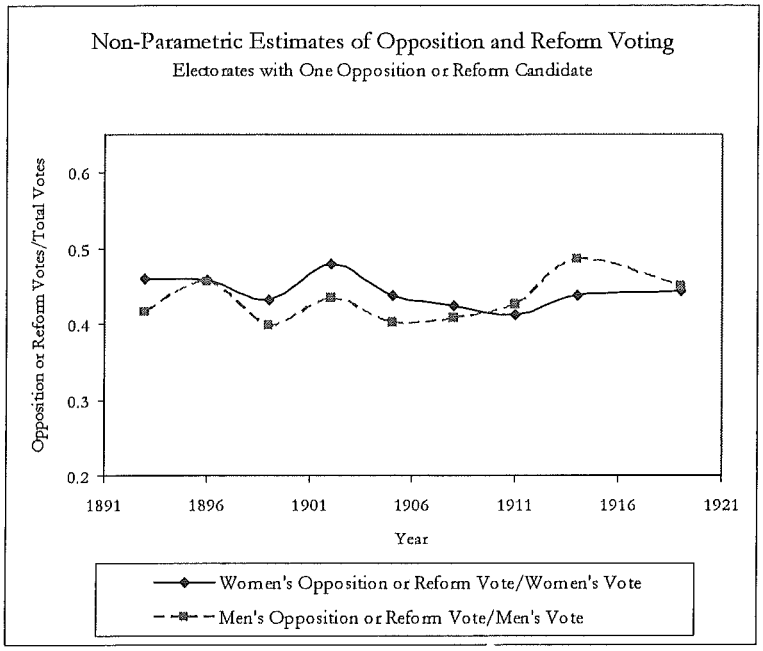

Figure 5.7 Non-Parametric Overall Estimates of Women's and Men's Opposition and Reform Voting 1893 to 1919

Both Liberal and opposition trends suggest that men's and women's preferences shifted at the elections of 1908 and 1914, a conclusion that confirms accounts of the development of party politics by other historians who have identified the period as a turning point in New Zealand party politics. Liberal decline and opposition rallying broke down existing coalitions, and Liberal dominance

ceased, to be replaced by what Bassett called 'three party politics', as Labour entered electoral contests.[16] The presence of third party candidates does not alter the estimates for men's and women's Reform and Liberal preferences. However, neither Reform nor Liberal gained majority support from 1911 to 1919. (The overall vote for each party is shown in Table 5.7 and Table 5.8.) Unfortunately there were too few Labour candidates to warrant estimation of men's and women's Labour votes in 1911 and 1914, and since that left only one election where men's and women's Labour votes could be determined, estimates of men's and women's Labour voting are not considered here.[17]

The overall estimates of men's and women's voting suggest that it was not just party politics that changed around 1911, but the preferences of men and women were also shifting. From 1899 to 1908, the overall estimates suggest that men and women had both preferred Liberals overall, with men more likely to support Liberals than women and women more likely than men to support opposition candidates. At the elections of 1908 and 1911 the relationship between gender and voting apparently changed, before settling down to the reverse pattern in 1914 and 1919 when women were more likely than men to support Liberal candidates, and men more likely to support Reform. This result highlights an area for new research. What role did the invocation of gender and gender difference play in the re-working of partisan preferences between 1908 and 1914? What role did the Labour party play in these changes? Was party organization split by gender? This suggests paying attention to electoral propaganda and party organization at these elections.

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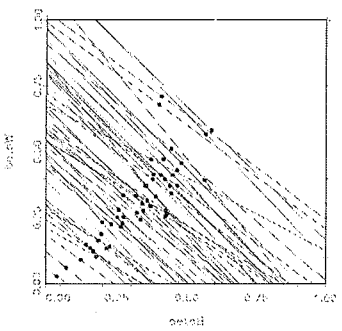
[16] Bassett, *Three Party Politics in New Zealand, 1911-1931.*

[17] The overall estimates of men's and women's Labour preferences suggest women were more likely to support Labour than men in 1919. The estimates of men's and women's Labour votes over 51 electorates were 0.3173 (standard error 0.0268) and 0.3388 (standard error 0.0285) respectively. The overall known Labour vote in those electorates was 0.328. The tomography plot for Labour voting in 1919, with non-parametric estimates marked, is shown below. The outliers are Buller and Wellington East.



Interestingly, this result confirms the analysis of men's and women's turnout in Chapter Three. Turnout figures suggest that 1911 was an unusual year, with women's turnout exceeding men's in a number of electorates. The differences were attributed to a rise in the activities of women's political organisations, changes in party organization, particularly Labour and Reform attempts to mobilize women, and the stimulus of a heightened campaign for prohibition at that election. The suggestion that changes in patterns of party voting coincided with shifts in turnout, party organization and opinions about prohibition at 1911, confirms the status of the 1911 election as a key election of the early twentieth century. Further research is needed, however. If the estimates are correct, why did Reform's attempts to mobilize women not translate into higher Reform votes? A closer look at electorate estimates and local election campaigns would inform the pattern shown by the overall estimates.[18]

The estimates for the period after 1911 also suggest that claims that women were more conservative than men do not hold in this period. Estimates suggest that women's preference for conservative opposition candidates exceeded men's at earlier elections, although not in all electorates. However, in 1914 and 1919, women were less likely than men to support the conservative Reform Party. Further research might indicate what kind of factors influenced men's and women's votes at those elections.

Significant differences between men's and women's party preferences at the overall level suggest that the hypothesis that party vote was not polarized by gender is incorrect. The pattern shown by the overall estimates does not necessarily reflect the electorate-level pattern, however. Electorate estimates are not detailed here, but Figure 5.8 to Figure 5.23 show the tomography plots with electorate estimates for Liberal, opposition and Reform voting from 1896 until 1919. In some years, the electorate estimates reflect the overall pattern, but in some years they do not. The tendency for each year can be assessed by comparing the number of points that fall above or below the diagonal y = x line which crosses the graphs. If most points fall above the line, then in most electorates men's

[18] V. O. Key defined 'critical elections' as those where interest and turnout amongst voters was high, and where the decisive result of the election indicated a shift in voter alignment that persisted for a number of elections. 1911 does not exhibit all of these characteristics. In particular, its results were uncertain. It was not immediately clear whether Liberal or Reform would form a government. Neither was turnout particularly high. However, there were changes in patterns of turnout and voter alignment in 1911 which suggest that 1911 can be considered a turning point election. V. O. Key, 'A Theory of Critical Elections,' *Journal of Politics* 17 (1955).

preference for the party exceeded women's. If most points fall below the y = x line, then in most electorates, women's preference for the party exceeded men's.

In Figure 5.8 to Figure 5.23 women's preference for the relevant party is shown on the x-axis, and men's on the y-axis. For each electorate, true values must lie on the appropriate tomography line. Estimates are shown by the marked points on the lines. Consider Figure 5.11 for example, which shows estimates for Liberal voting in 1911. Most estimates fall above the diagonal line, y = x, suggesting that in most electorates, men's preference for the Liberal candidate exceeded women's.

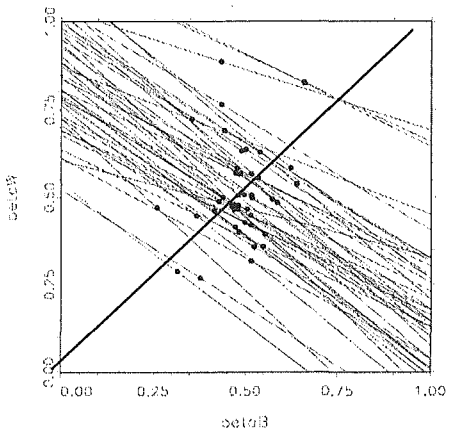


Figure 5.8 Tomography plot for Liberal Voting 1896, with Non-Parametric Estimates

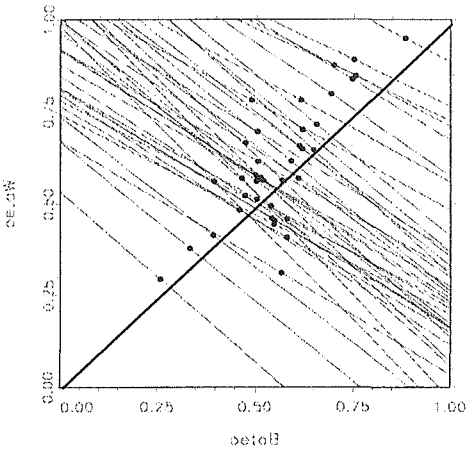


Figure 5.10 Tomography plot for Liberal Voting 1902, with Non-Parametric Estimates

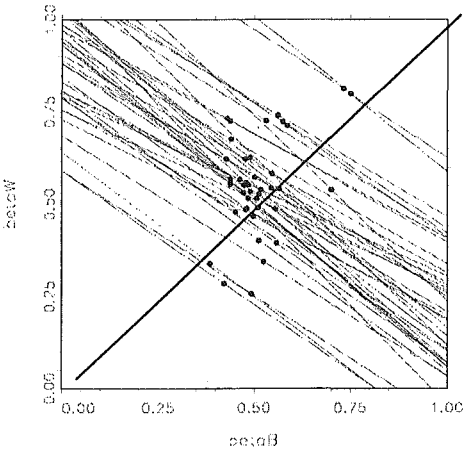


Figure 5.9 Tomography plot for Liberal Voting 1899, with Non-Parametric Estimates

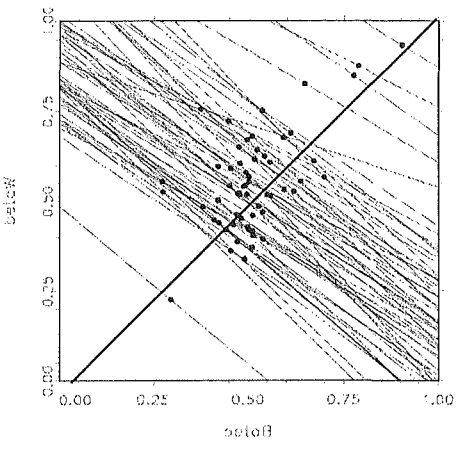


Figure 5.11 Tomography plot for Liberal Voting 1905, with Non-Parametric Estimates

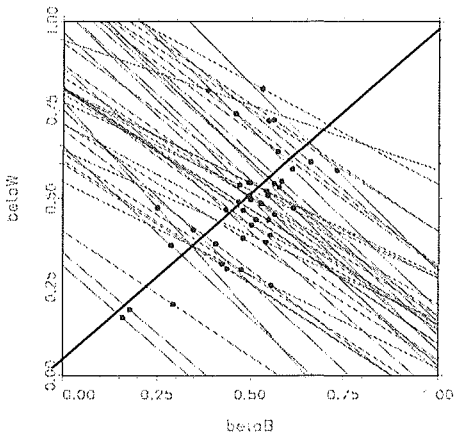


Figure 5.12 Tomography plot for Liberal Voting 1908, with Non-Parametric Estimates

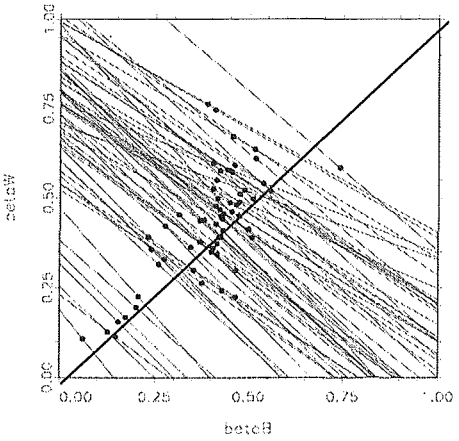


Figure 5.13 Tomography plot for Liberal Voting 1911, with Non-Parametric Estimates

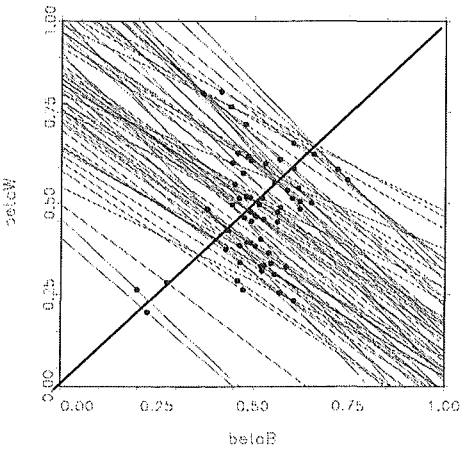


Figure 5.14 Tomography plot for Liberal Voting 1914, with Non-Parametric Estimates

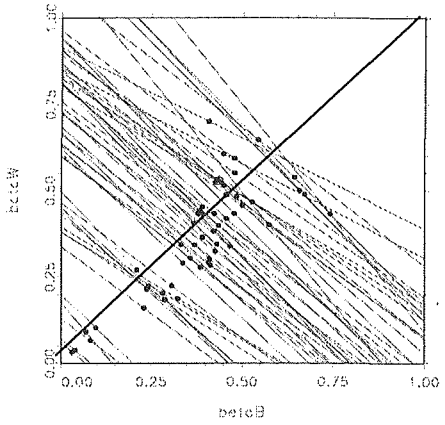


Figure 5.15 Tomography plot for Liberal Voting 1919, with Non-Parametric Estimates

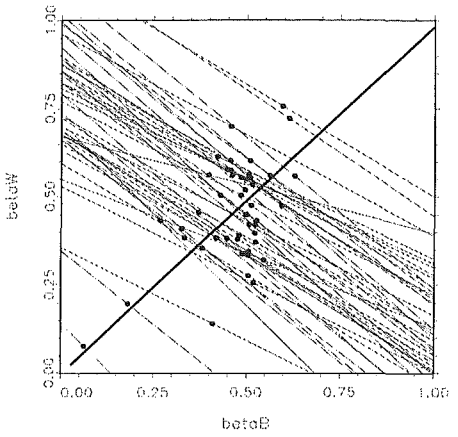


Figure 5.16 Tomography plot for Opposition Voting 1896, with Non-Parametric Estimates

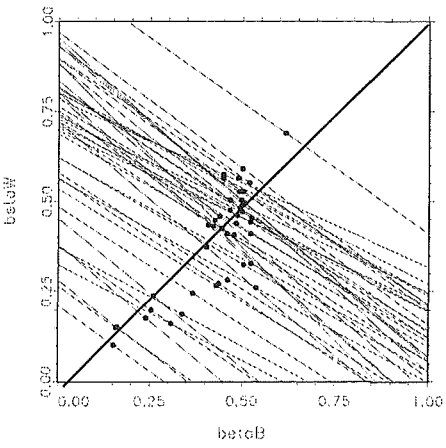


Figure 5.17 Tomography plot for Opposition Voting 1899, with Non-Parametric Estimates

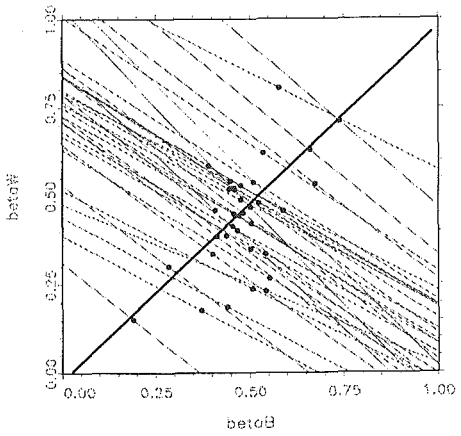


Figure 5.18 Tomography plot for Opposition Voting 1902, with Non-Parametric Estimates

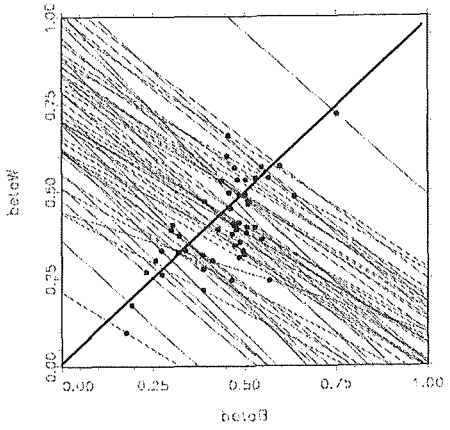


Figure 5.19 Tomography plot for Opposition Voting 1905, with Non-Parametric Estimates

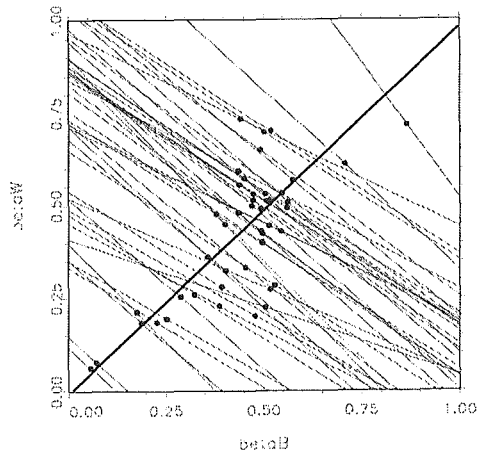


Figure 5.20 Tomography plot for Opposition Voting 1908, with Non-Parametric Estimates

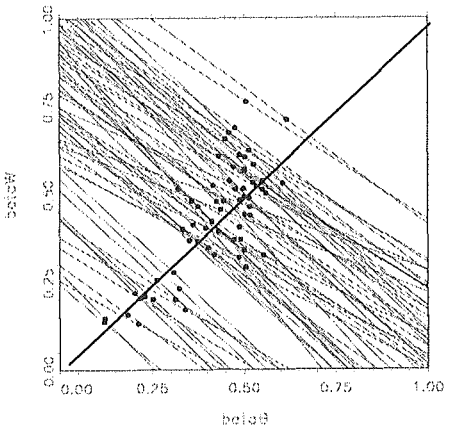


Figure 5.21 Tomography plot for Opposition Voting 1911, with Non-Parametric Estimates

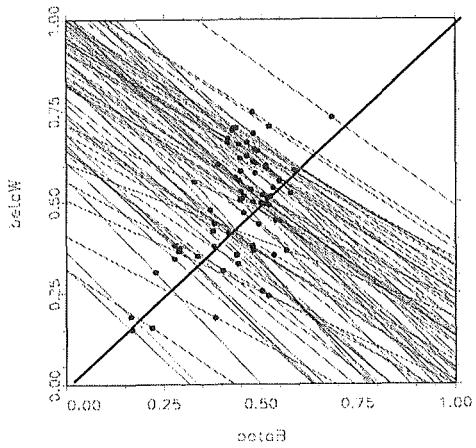


Figure 5.22 Tomography plot for Reform Voting 1914, with Non-Parametric Estimates

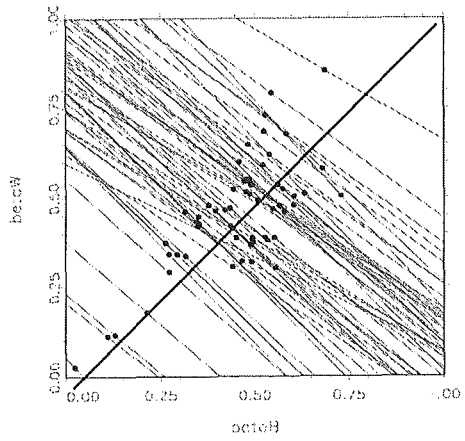


Figure 5.23 Tomography plot for Reform Voting 1919, with Non-Parametric Estimates

Consider also Figure 5.16 which shows the estimates for opposition votes in 1896. The overall estimates for men's and women's support of the opposition were very similar at 45.5% and 45.8% respectively. The chi-square test suggested the difference was not significant. Figure 5.16 suggests that opposition votes varied between electorates with electorates falling on both sides of the y = x line. Thus the equality of the overall estimates do not reflect equality of estimates at the electorate level, but rather differences that effectively cancel out when the electorates are combined.

Figure 5.8 to Figure 5.23 also reveal the extent of variation between electorates. In all elections, the estimates were scattered on both sides of the line. The extent of variation in support for the Liberal candidates amongst electorates over time is shown in Figure 5.24, which summarises the plots for Liberal voting shown in Figure 5.8 to Figure 5.15. Figure 5.24 shows the range in the difference between men's and women's Liberal preferences at electorate level. The y = 0 line corresponds to the diagonal line y = x in the above figures. If the median falls above the y = 0 line, most electorates estimates appear below the diagonal line in the appropriate tomography plot, and so in most electorates, women's preference for the relevant party exceeded men's. If the median for a particular election falls below the y=0 line, then the opposite is true: most electorate estimates fall above the diagonal line in the appropriate tomography plot, and men's preference for the relevant party exceeds women's preference for that party. In 1911 for example, the median line falls just below zero, indicating that in just over half of the electorates, men's support for the Liberals exceeded women's support for the same party. In some electorates, the estimates of men's and women's Liberal votes differed by up to 40 percentage points, but in many electorates the differences were relatively small. Differences between women's and men's support for opposition and Reform candidates show similar variation. The ranges for these differences are shown in Figure 5.25. (Note that significance is not taken into account in these figures.)

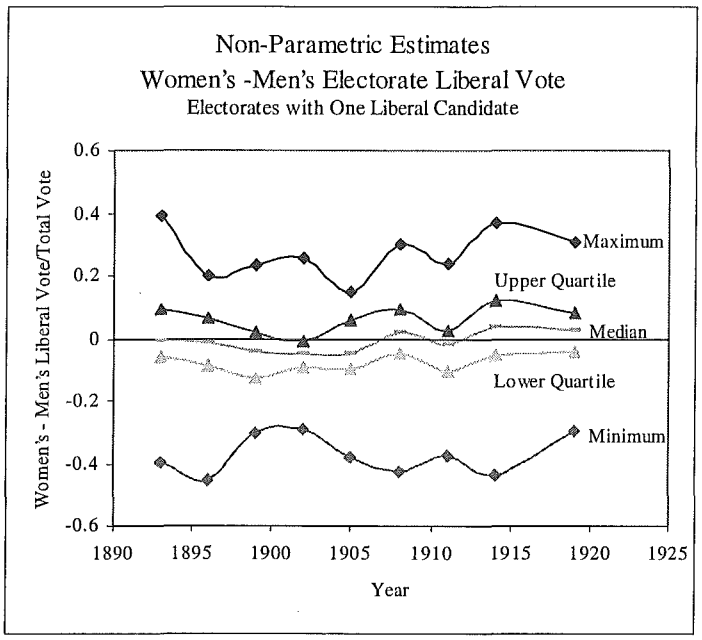


Figure 5.24 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's Liberal Voting 1893 to 1919

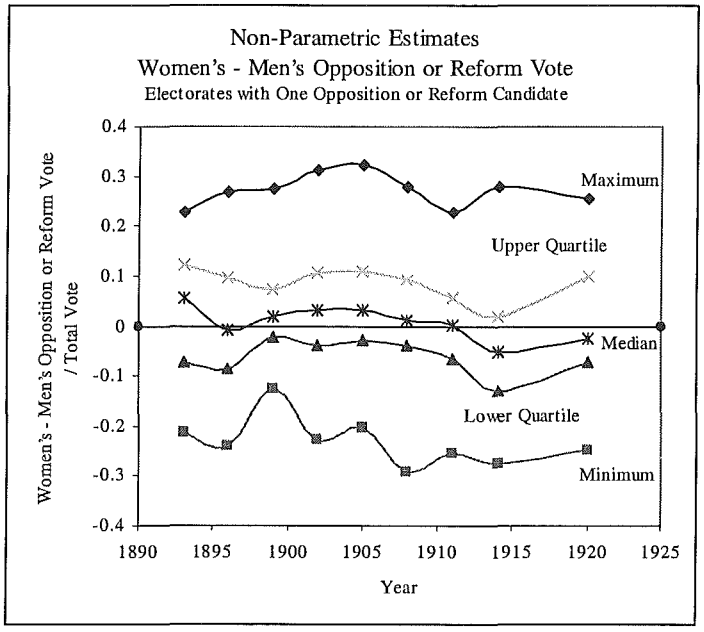


Figure 5.25 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's Opposition and Reform Voting 1893 to 1919.

The variation in electorate estimates of men's and women's voting preferences supports the hypothesis that gender interacted with other factors to shape individuals' partisan opinions at a local level. The evidence suggests that these were not broad structural factors such as social and economic conditions, although further investigation is needed to confirm this. Consider Reform voting at the 1911 election. Men's and women's party preferences at that election varied only randomly with both the rural population proportion and the degree of population change, as shown for the Reform vote in Figure 5.26 to Figure 5.29.

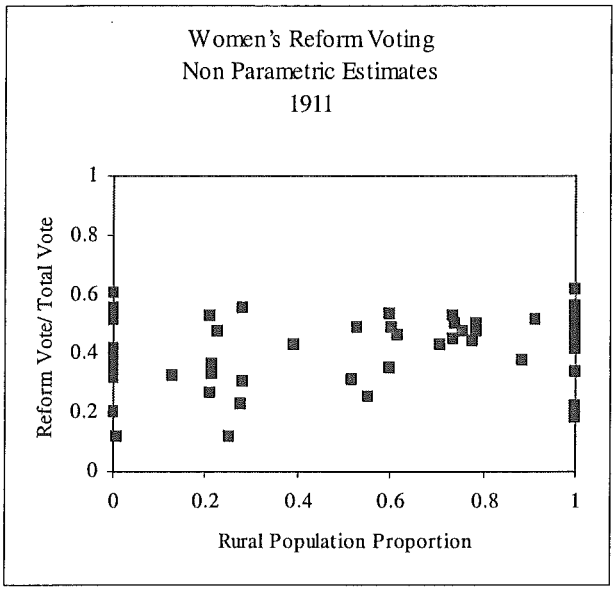


Figure 5.26 Non-Parametric Estimates of Women's Votes for Reform Candidates and Rural Population Proportion for 64 Electorates, 1911

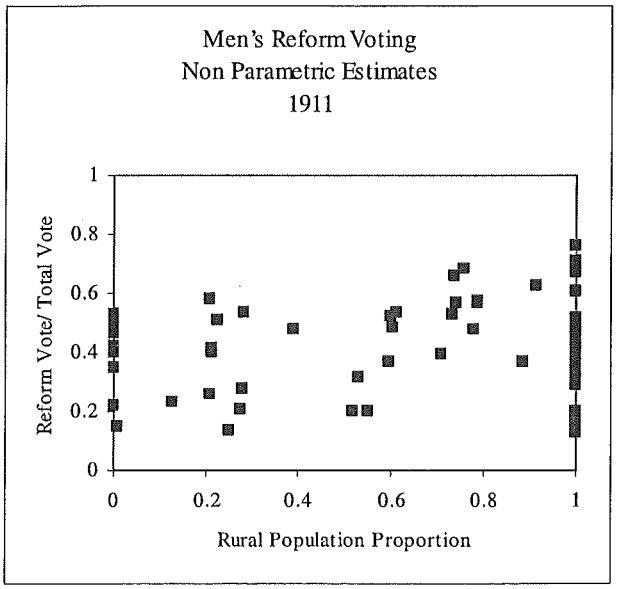


Figure 5.27 Non-Parametric Estimates of Men's Votes for Reform Candidates and Rural Population Proportion for 64 Electorates, 1911

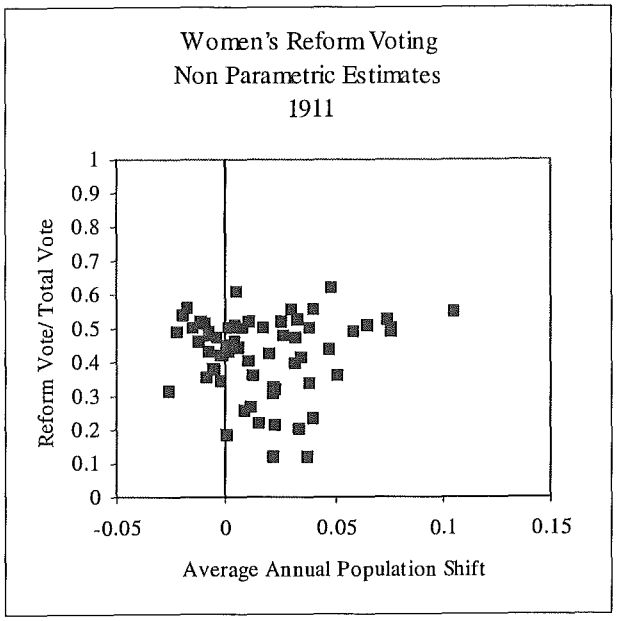


Figure 5.28 Non-Parametric Estimates of Women's Votes for Reform Candidates and Average Annual Population Shift for 64 Electorates, 1911

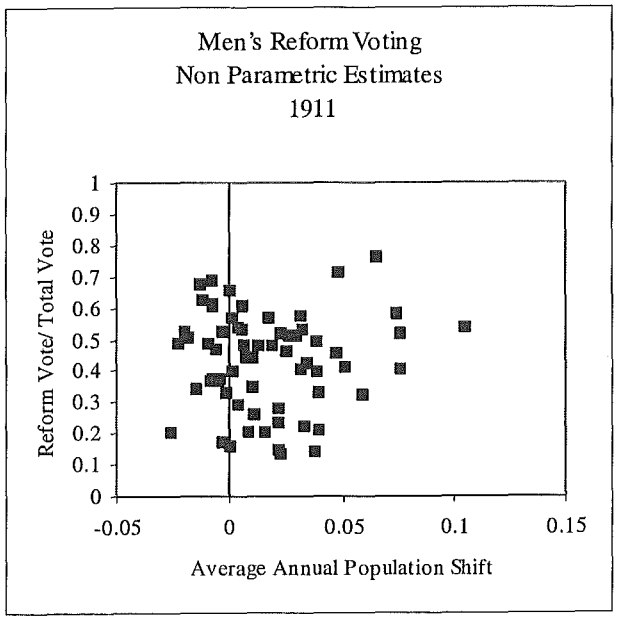


Figure 5.29 Non-Parametric Estimates of Women's Votes for Reform Candidates and Average Annual Population Shift for 64 Electorates, 1911

Prohibition Voting

The prohibition polls provide the opportunity of examining gender difference in votes for and against the prohibition of alcohol. As noted in Chapter Two, it was widely believed that women were more likely to support prohibition in 1893. Temperance advocates and some suffragists provided arguments for women's special interest in prohibition. No platforms were offered by which women could construct their opposition to prohibition based on their femininity, but as Jock Phillips has argued, prohibitionists competed with brewers to link masculinity with the refusal or consumption of alcohol.[19] However, the evidence from the Christchurch election campaign of 1893 suggests that men and women fell on both sides of the prohibition spectrum.

Accounts of prohibition have considered whether women were more likely to support prohibition, but have largely concluded that there was no evidence to support the claim. Newman argued that there was little evidence that women 'disproportionately' supported prohibition options in 1911 and claimed that support for prohibition varied amongst different groups, with back-country and urban working class electorates less likely to support prohibition than established farming areas or suburban electorates. Grigg reviewed a wider range of evidence regarding women's support for prohibition, and found little that suggested women voted for prohibition in larger numbers than men. Some of his analyses were, however, fraught by the ecological fallacy.[20]

Ecological inference techniques offer a real advance in testing for gender differences in prohibition votes since these techniques allows direct estimation of men's and women's prohibition votes. Estimates of men's and women's voting at prohibition polls produced by the non-parametric method generally show firmer gender differences than estimates of party votes. As before, the estimates have large standard errors reflecting uncertainty, and there is some evidence that mean independence does not hold. Overall estimates show a significant difference between men's and women's preferences, which was generally reflected in the electorate estimates.

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[19] Jock Phillips, *A Man's Country? The Image of the Pakeha Male*, Revised ed. (Auckland: Penguin Books (NZ) Ltd, 1996), pp.44-80.

[20] A. R. Grigg, 'Prohibition and Women: The Preservation of an Ideal and a Myth,' *New Zealand Journal of History* 17, no. 2 (1983); Richard Newman, 'New Zealand's Vote for Prohibition in 1911,' *New Zealand Journal of History* 9, no. 1 (1975).

Estimation of men's and women's votes at the first prohibition poll of 1894 is frustrated by the complexity of the poll and so I do not consider it here. Voters could vote for the continuance, reduction or prohibition of liquor licenses in three types of establishment: pubs, accommodation and bottle stores. The regulations stated that at least one half of registered voters must cast a vote before any option would be passed. Furthermore an absolute majority of the votes was required to pass either continuance or reduction, and a three-fifths majority was required to pass prohibition. In 33 electorates, the poll was void because the turnout was too low, and in another two electorates the required majority was not reached and so no proposal was carried. Of the remaining electorates, most passed continuance, but, in fourteen electorates, reduction passed in at least one of the three license categories, and in Clutha, prohibition passed in all three license categories. Turnout was however, very low amongst men and women. Only 30% of adult women cast a vote at the poll and 39% of men. As A. R. Grigg noted, low turnout suggested that most men and most women were not passionate about the issue of temperance.[21] The electorate results show no clear gender pattern. For example, in Clutha, where all three no license options passed, women's turnout was high at 73.5%, compared with men's turnout at 53.6%. However, women made up only 32% of those voting, so it seems unlikely that women would have swayed the result.

After the 1894 poll, the requirements were somewhat simplified. The polls were held at general elections, substantially increasing the turnout. The requirements for absolute or three-fifths majorities were initially carried over, but all licenses were now considered together and no longer split into classes. Until 1908, voters could choose to support up to two of the three options for local liquor licensing, namely, continuance, reduction or prohibition of liquor licenses in their district. After 1908, only two local options were offered, prohibition or 'no license' and continuance, and the focus shifted to votes for national continuance or prohibition. In 1919 a special licensing poll was held where only national options were available. At the general election in December 1919, a second licensing poll was held, where voters could choose between three options for national licensing, continuance, prohibition or state control of alcoholic liquors. A 60% majority was required to pass national prohibition in 1911 and 1914, but this was reduced to 50% in 1919.

A number of electorates passed local no license in the local polls, but most electorates favoured continuance. The highest vote for prohibition was recorded in 1911 when 56% of voters chose national prohibition after an intense public campaign engineered by prohibitionist organizations like the New Zealand Alliance. The Women's Christian

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[21] Grigg, 'Prohibition and Women.'

Temperance Union worked hard to gain women's votes in 1911. Yet the 56% vote for national prohibition was not enough to pass the measure, and it was in December 1919 that New Zealand came closest to going dry. At that election 49.7% of voters supported national prohibition, tantalisingly close to the required 50% majority. After 1919 support for prohibition declined, but the polls were not abolished until 1987.[22]

Local Licensing Polls

Consider the prohibition poll held at the 1896 election. Continuance passed in 52 districts. In the remaining ten electorates, no proposal passed. Prohibition or 'no license' reached an absolute, but not the required three-fifths majority in four electorates. Since voters could pick more than one option, we do not have a three by two table, but three two by two tables. Voters either ticked an option, or did not. Consider the table for continuance in Riccarton. The unknowns of interest are β_{bj} , women's vote for continuance/women's total vote, and β_{wj}, men's vote for continuance/men's total vote.

Table 5.9 Continuance Voting in the Riccarton Electorate, 1896[23]

Riccarton, 1896	Continuance	Not Continuance	Total
Women	V_{fcj} β_{bj}	V_{foj} $1-\beta_{bj}$	V_{fj} =1506 x_j = 0.454
Men	V_{mcj} β_{wj}	V_{moj} $1-\beta_{wj}$	V_{mj} =1808
Total	V_{cj} =2108 t_j = 0.636	V_{oj} =1208	3314

Tables for reduction and no License are similar. Graphs do not indicate that either population shifts nor the rural population proportion caused aggregation bias in the continuance vote, and so estimation proceeds. Results for 1896 are shown in the following table. The relevant tomography plot is shown in Figure 5.30.

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[22] John D. Prince, 'Look Back in Amber: The General Licensing Poll in New Zealand, 1919-1987,' *Political Science* 48, no. 1 (1996). Raewyn Dalziel, 'New Zealand Women's Christian Temperance Union,' in *Women Together: A History of Women's Organisations in New Zealand. Nga Ropu Wahine O Te Motu*, ed. Anne Else (Wellington: Historical Branch of Internal Affairs and Daphne Brasell Associates Press, 1993), p.73; Newman, 'New Zealand's Vote for Prohibition.'

[23] The subscript 'c' refers to continuance.

Table 5.10 Non-Parametric Estimates of Men's and Women's Vote for the Continuance Option 1896

1896 62 electorates Palmquist Inflation Factor=64.6739	Women's Continuance Vote / Women's Total Vote	Standard Error	Men's Continuance Vote / Men's Total Vote	Standard Error
Overall Bounds	(0.0288,0.9946)		(0.2060,0.9014)	
King's Non-parametric Estimates	0.4976	0.0409	0.5656	0.0293

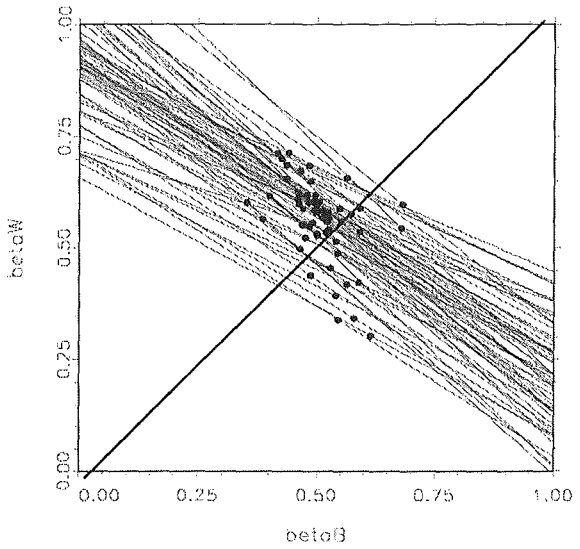

Figure 5.30 Tomography plot for Continuance Voting, with Non-Parametric Estimates for 62 Electorates, 1896 (Women's Continuance Vote / Women's Total Vote (β_{bj}) is shown on the horizontal axis and Men's Continuance Vote / Men's Total Vote (β_{wj}) is shown on the vertical axis.)

Bounds do not much limit the possibilities for either men's or women's vote for continuance, although the bounds on men's continuance vote are narrower. Overall bounds and estimates are shown in Table 5.10. Diagnostics suggest a good fit, although standard errors on electorate estimates remain wide. Non-parametric estimates are plausible, suggesting that men were more likely to support continuance than women. Just under 50% of women apparently supported continuance, compared with 57% of men. Electorate specific estimates are listed in Appendix Three.

Figure 5.30 shows the electorate estimates of women's continuance vote on the horizontal axis against men's continuance vote on the vertical axis. True values for each electorate must lie on the relevant tomography line. Non-parametric estimates are marked on the lines. The plot suggests that where women's continuance vote is low, men's is high, and vice versa. The estimates also suggest that, in most electorates, men were more likely to vote for continuance

than women, since most estimates lie above the diagonal y = x line. The chi-square statistic suggests this difference was significant. It was 1155.0733, with p-value <0.0001, less than 0.05, and so the null hypothesis that men's and women's preferences for continuance were equal in 1896 can be rejected, and the alternative hypothesis, that they were significantly different, can be accepted.

The diagnostics suggest the fit of models estimating men's and women's votes for the remaining options, Reduction and No License, are reasonable, though not quite as good as for continuance. In both cases, the estimates suggest that women were more likely to vote for the prohibition options of reduction and no license. The overall estimates are shown in Table 5.11 and Table 5.12. Differences were significant in both cases. For reduction, the chi-square statistic was 5337.7486, with p-value <0.0001. For no license, the chi-square statistics was 616.4918, with p-value <0.0001. These results indicate that men's and women's preferences for reduction and for no license were significantly different.[23]

The electorate estimates show a much more consistent pattern than electorate estimates for party votes, with women apparently more likely to vote for both reduction and continuance in most electorates. Electorate estimates are shown on the tomography plots in Figure 5.31 and Figure 5.32 and are listed in Appendix Three. As before, each line shows the range of possible values for men's and women's support for the option for each electorate, and the non-parametric electorate estimate is marked on the relevant line. The y = x line crosses the graph.

Table 5.11 Non-Parametric Estimates of Men's and Women's Vote for the Reduction Option 1896

1896 62 electorates Palmquist Inflation Factor=64.6739	Women's Reduction Vote / Women's Total Vote	Standard Error	Men's Reduction Vote / Men's Total Vote	Standard Error
Overall Bounds	(0.0000,0.8517)		(0.0122,0.6223)	
King's Non-parametric Estimates	0.4446	0.0355	0.3038	0.0254

[23] The null hypothesis is that there was no difference between men's and women's preferences for the relevant option. The alternative hypotheses, accepted here, is that there was a significant difference between the two.

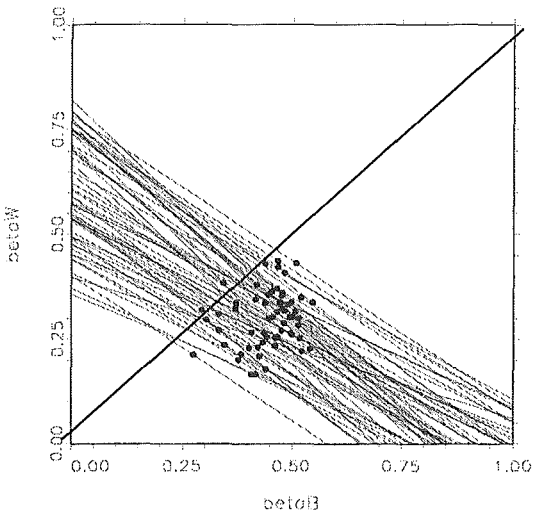

Figure 5.31 Tomography plot for Reduction Voting, with Non-Parametric Estimates for 62 Electorates, 1896 (Women's Reduction Vote / Women's Total Vote (β_{bj}) is shown on the horizontal axis and Men's Reduction Vote / Men's Total vote (β_{wj}) is shown on the vertical axis.)

Table 5.12 Non-Parametric Estimates of Men's and Women's Vote for the No License Option 1896

1896 62 electorates Palmquist Inflation Factor=64.6739	Women's No License Vote / Women's Total Vote	Standard Error	Men's No License Vote / Men's Total Vote	Standard Error
Overall Bounds	(0.0000,0.8500)		(0.0345,0.6484)	
King's Non-parametric Estimates	0.4059	0.0369	0.3576	0.0264

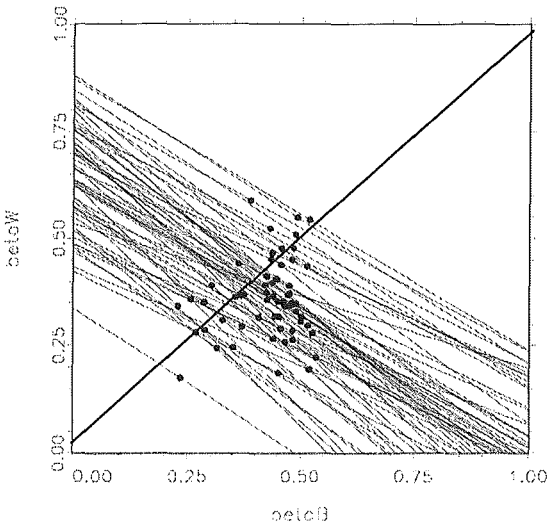

Figure 5.32 Tomography plot for No License Voting, with Non-Parametric Estimates for 62 Electorates, 1896 (Women's No License Vote / Women's Total Vote (β_{bj}) is shown on the horizontal axis and Men's No License Vote / Men's Total vote (β_{wj}) is shown on the vertical axis.)

The non-parametric estimates provide good evidence that women were more likely to vote for prohibition than men in 1896, confirming suffragists' claims that women were more interested in prohibition than men. However, the estimates suggest that only a minority of women supported the temperance options of no license and reduction. Women's greater enthusiasm for prohibition does not translate into majority support for prohibition.

The Palmquist inflation factors, listed in Table 5.10 to Table 5.12 are still high for these data-sets, indicating high information loss through aggregation, so why does the non-parametric method provide more consistent electorate estimates for the prohibition data? This is a difficult question to answer, and it is important to note that diagnostics continue to indicate the presence of aggregation bias amongst the non-parametric electorate estimates. There was, however, generally less variation between electorate prohibition voting than electorate party voting, evident when comparing the spread of the tomography lines in the tomography plots of Figure 5.2 and Figure 5.30. There was a larger spread amongst lines for party voting. Furthermore, since each electorate had the same prohibition options, comparability between electorates is not compromised, and in the earlier elections at least, the number of data-points is substantially larger. There were only 32 electorates with one Liberal candidate in 1893, but all 62 electorates can be included in the analysis of prohibition voting in 1896.

The estimates for overall prohibition voting for local options at elections from 1896 until 1914 are shown in Table 5.13. The overall patterns are shown in Figure 5.33, Figure 5.34 and Figure 5.35. The quality of the estimates varies, but in most years, there is evidence of aggregation bias, and some variation amongst the electorate estimates which have large standard errors. Electorates specific estimates of women's and men's voting at Local Licensing Polls from 1896 until 1914 is shown in Appendix Three.

Table 5.13 Non-Parametric Estimates of Overall Prohibition Voting 1896 to 1914

Year	Number Electorates	Palmquist Inflation Factor	Option	Total Vote for Option/Votes Cast (Truth)	Women's Option Vote/ Women's Vote Non-Parametric Estimate	Standard Error	Men's Option Vote/ Men's Vote Non-Parametric Estimate	Standard Error	Overall Chi-Square	Significance
1896	61	64.0739	Continuance	0.5372	0.4976	0.0409	0.5656	0.0293	1155.0733	<0.0001
			Reduction	0.3625	0.4446	0.0355	0.3038	0.0254	5337.7488	<0.0001
			No License	0.3778	0.4059	0.0369	0.3576	0.0264	616.4919	<0.0001
1899	60	74.8283	Continuance	0.5058	0.4729	0.0437	0.5305	0.0327	901.7554	<0.0001
	59	74.9925	Reduction	0.3814	0.4711	0.0385	0.3126	0.0288	7221.1604	<0.0001
	60	74.8283	No License	0.4208	0.4404	0.0408	0.406	0.0306	330.1709	<0.0001
1902	67	75.6193	Continuance	0.4667	0.4434	0.0389	0.4847	0.0299	530.2220	<0.0001
			Reduction	0.4196	0.5155	0.0371	0.3458	0.0286	9153.6107	<0.0001
			No License	0.4737	0.5044	0.041	0.45	0.0315	917.4115	<0.0001
1905	61	87.5606	Continuance	0.4502	0.4555	0.0362	0.4462	0.0273	26.1217	<0.0001
			Reduction	0.3848	0.4731	0.0295	0.3183	0.0222	7625.2761	<0.0001
			No License	0.4972	0.5036	0.0402	0.4923	0.0302	37.8550	<0.0001
1908	58	89.9451	Continuance	0.4535	0.4333	0.0348	0.4687	0.026	382.9551	<0.0001
			Reduction	0.4022	0.4876	0.0395	0.3387	0.0295	6874.5084	<0.0001
			No License	0.5181	0.5413	0.0314	0.5009	0.0235	496.3942	<0.0001
1911	50	76.0969	Continuance	0.4885	0.4524	0.0413	0.5059	0.0313	1220.4072	<0.0001
			No License	0.4677	0.4956	0.0399	0.4466	0.0303	729.8309	<0.0001
1914	52	74.0571	Continuance	0.5353	0.5244	0.0377	0.616	0.0291	2918.7983	<0.0001
			No License	0.4284	0.4882	0.0427	0.4422	0.0329	723.3613	<0.0001

Note that not all electorates are included in the analyses and hence the values listed for the total vote for each option may not correspond to the national total. For example outliers were excluded for some years, and Auckland, Wellington, Dunedin and Christchurch gave combined returns from 1908 and were excluded from the analysis.
The null hypothesis for the chi-square test is that there was no difference between men's and women's support for the relevant option (i.e. $\beta_b = \beta_w$). The alternative hypothesis states that there was a difference (i.e. $\beta_b \neq \beta_w$). The significance level is set at 0.05.

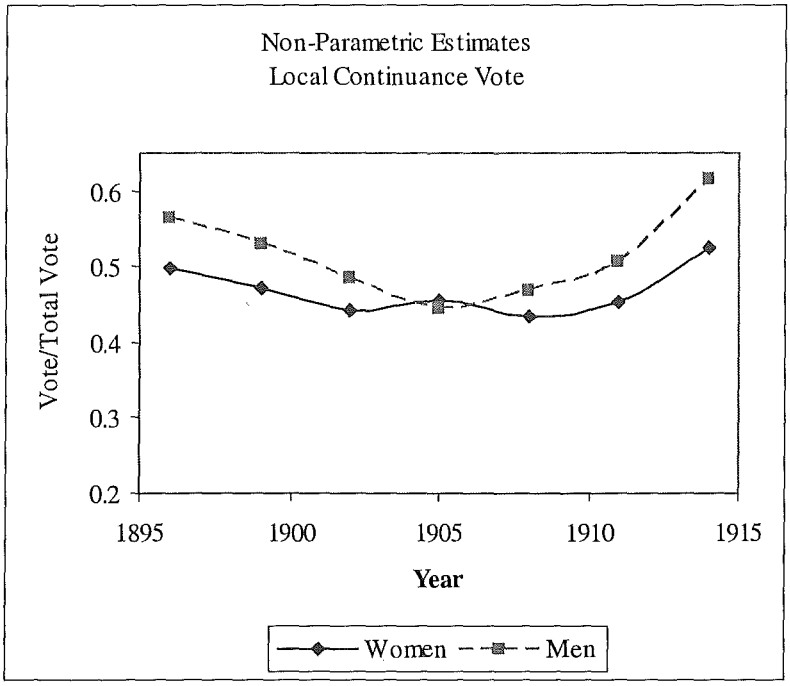

Figure 5.33 Non-Parametric Overall Estimates of Women's and Men's Local Continuance Voting, 1896 to 1914

Figure 5.33 shows that a majority of men supported local continuance in 1896 and 1899, but only a minority of men, although a substantial one, supported continuance at the 1902, 1905 and 1908 polls. It was only in 1914 than a majority of women supported continuance and women were less likely to support continuance than men at all elections, with the exception of 1905 when women were apparently slightly more likely to support continuance then men. The difference was significant at all elections, including 1905. The chi-square statistics and their p-values are shown in Table 5.13. All p-values are less than 0.05, enabling the rejection of the null hypothesis that women and men's support for continuance was equal. The alternative hypothesis can be accepted. Women's preference for continuance was significantly different from men's.

The trend in support for the Reduction option is shown in Figure 5.34. This was always a minority option amongst all voters. The plot suggests that women were far more likely to support this option than men, with the estimates suggesting than in 1902 around 51% of women supported that option.

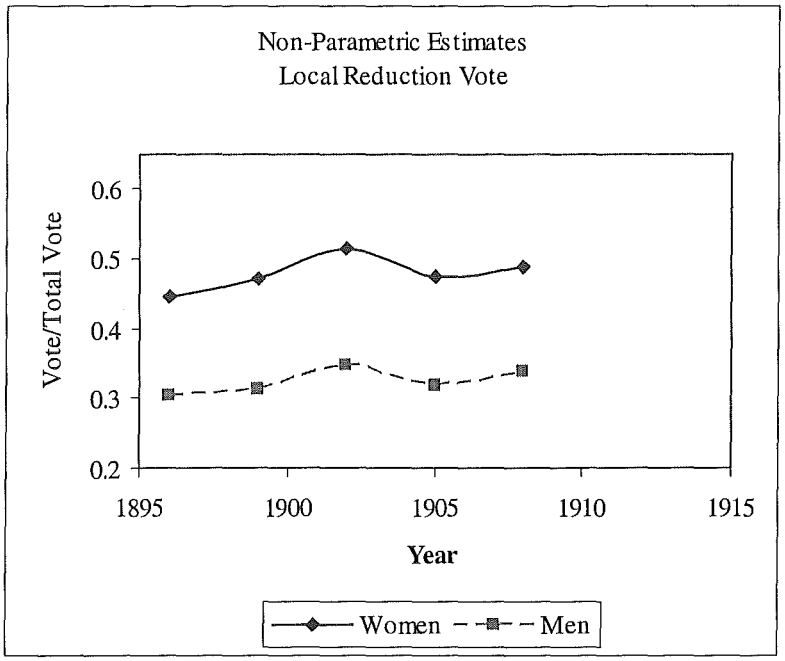

Figure 5.34 Non-Parametric Overall Estimates of Women's and Men's Local Reduction Voting, 1896 to 1914

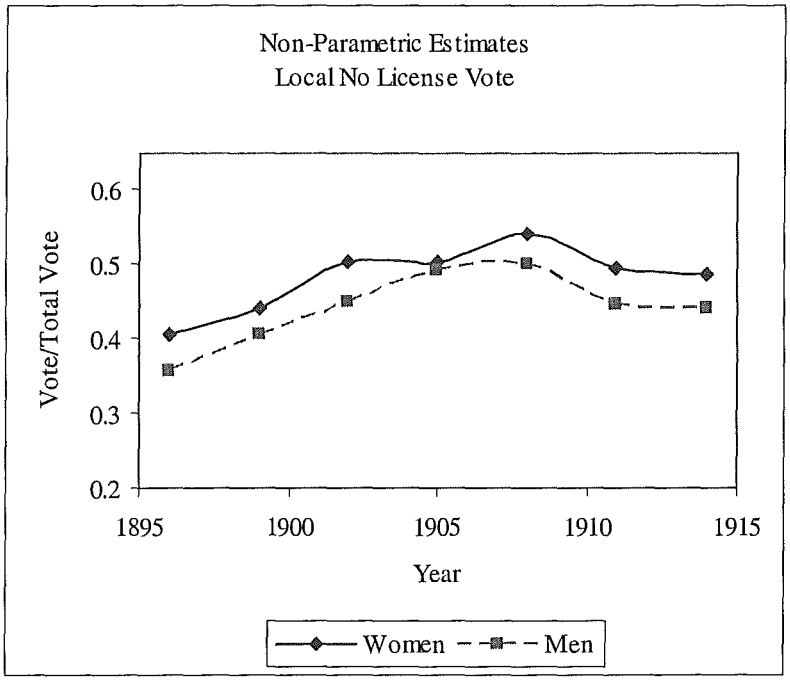

Figure 5.35 Non-Parametric Overall Estimates of Women's and Men's Local No License Voting, 1896 to 1914

Figure 5.35 shows the overall estimates of men's and women's support for local no license. This graph is the mirror of the continuance graph shown in Figure 5.33. Women's support for no license exceeded men's in all years except 1905, and the chi-square test suggests that the difference was significant in all years. Chi-square statistics are shown in Table 5.13. Before 1908 less than half of all voters supported no license, but the estimates suggest that from 1902 to 1908 more than half of women supported no license.

The electorate specific estimates tend to follow the overall estimates to a greater degree than those for party vote, as shown in Figure 5.36 to Figure 5.38. Tomography plots are not shown here, but Figure 5.36 to Figure 5.38 summarise the tomography plots. These figures show the range in the difference between estimates of men's and women's votes for the three options. In years where the median is above zero, the majority of the electorate estimates indicated that women's vote exceeded men's. In years where the median was below zero, the majority of electorate estimates suggest that men's vote exceeded women's. Consider 1896 for example. The overall estimates for continuance voting suggested that men were more likely to support that option than women. The estimates were 0.5656 for men and 0.4976 for women. The overall difference is shown in Figure 5.33. Figure 5.36 shows the range in the difference between men's and women's electorate estimates. At -0.067, the median falls below zero, as does the upper quartile. Hence, in 75% of electorates, the estimates suggest men's vote for continuance exceeded women's.

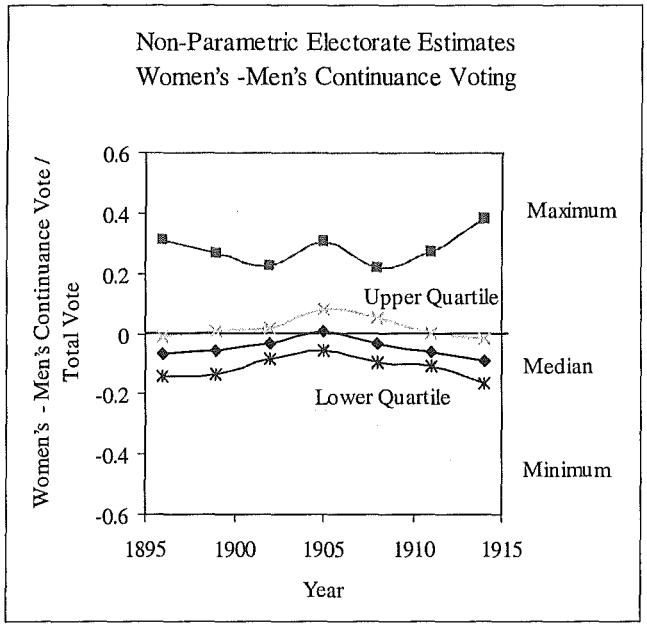

Figure 5.36 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's Continuance Voting 1896 to 1914

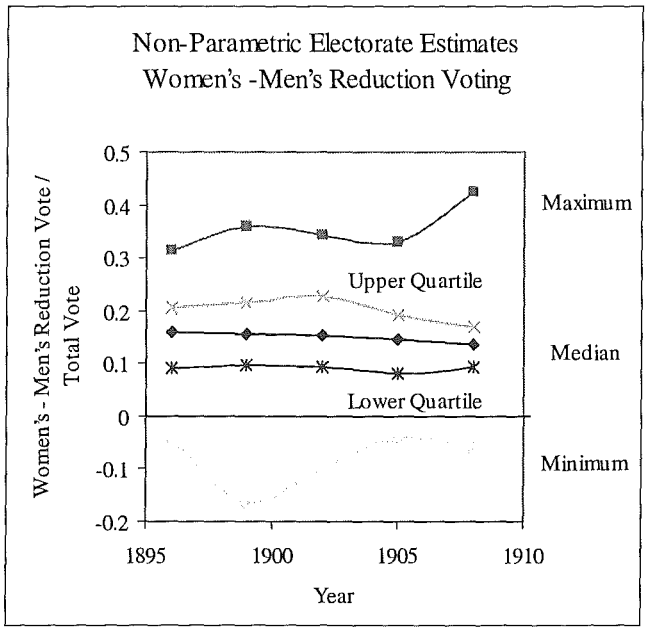

Figure 5.37 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's Reduction Voting 1896 to 1914

Figure 5.37 reveals the substantial difference between women's and men's votes for the reduction option. Women were apparently more likely to vote for reduction in a large majority of the electorates at all elections. The lower quartile lies above zero for all elections, indicating that in over 75% of electorates, women were apparently more likely to support reduction than men. The role of the reduction option in prohibition campaigns has been largely ignored by historians and needs further research. It may have acted as a kind of compromise option, being a measure for temperance rather than prohibition.

For continuance and no license the pattern is less strong, as shown in Figure 5.36 and Figure 5.38, but with the exception of 1905 electorate estimates, where the median is close to zero, the electorates estimates suggest that in most electorates men were more likely to support continuance and women more likely to support no licence.

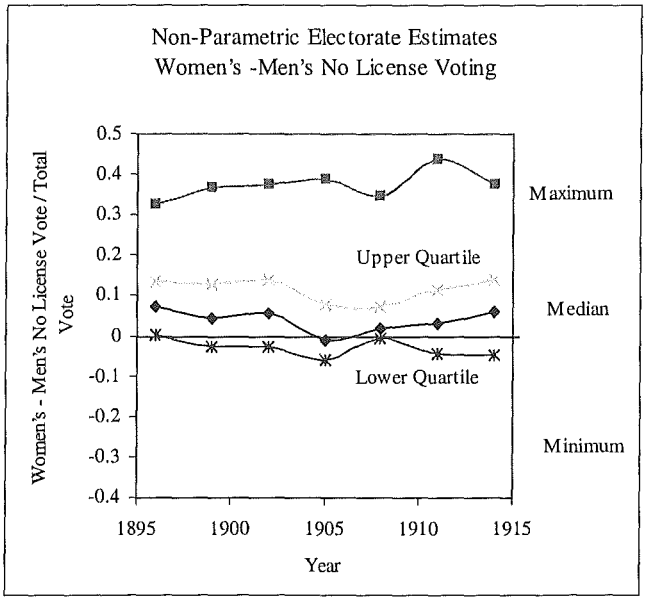

Figure 5.38 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's No License Voting 1896 to 1914

Both overall and electorates estimates suggest that 1905 was an unusual year, with men's and women's votes for no license and continuance very similar. Although the overall estimates suggest a significant difference between men's and women's support for these two options, the variation in the electorate estimates shows that the electorates were evenly split between those where women's support for the option exceeded men's and those where men's support for the option exceeded women's. As Figure 5.36 and Figure 5.38 show, the median difference between men's and women's support for prohibition was zero for both no license and continuance.

The estimates support the hypothesis that women were more likely to support prohibition measures at the overall and electorate levels, with the exception of 1905. These results suggest that we may need to review our understanding of the trajectory of prohibition polls. Historians have concentrated on polls for national prohibition which were held after 1911, paying less attention to local polls in the earlier period, despite the fact that a number of electorates did go dry as a result of the local licensing polls, suggesting at least pocket support for prohibition. The vote for local prohibition peaked in 1908, but the estimates suggest patterns of gender support for prohibition in 1905 may have been quite different from those at other elections.

National Licensing Polls

Non-parametric estimates for women's and men's votes for national options from 1911 show a slightly different pattern. The overall estimates are detailed in Table 5.14 and Figure 5.39 and Figure 5.40. Electorate specific estimates of men's and women's votes at national licensing polls between 1911 and 1919 are listed in Appendix Four. Historians have identified the 1911 election as the high point of the prohibition movement since it was at this election that the largest vote for prohibition was recorded. Of the valid votes cast, 55.8% supported national prohibition. The local option for prohibition was not as well supported that year, but the estimates in Table 5.13 suggest that women were more likely to support local prohibition than men at that poll. However the estimates for women's vote for national prohibition, shown in Table 5.14, suggest that men's preference for national prohibition exceeded women's. The overall estimates suggest most men and most women chose prohibition, with 54% of men who voted supporting national prohibition, but only 52% of women who voted supported national prohibition. The difference was significant. A chi-square statistic of 149.4358 had p-value <0.0001, less than 0.05, so the null hypothesis of no difference can be rejected, and we can conclude that women's support for national prohibition was significantly different from men's. This is a reverse of the overall pattern evident in the estimates for men's and women's preferences for local options, and for national options in 1914 and 1919. 1911 was the only year when men's support for prohibition apparently exceeded women's support for prohibition.

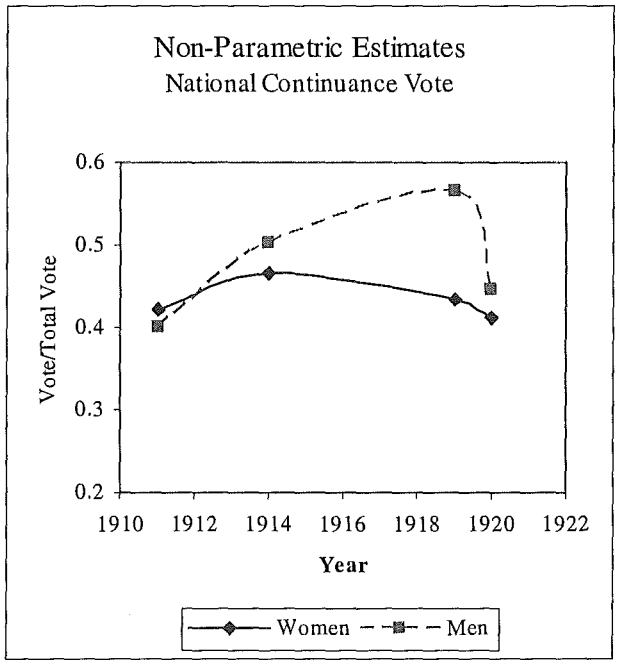

Figure 5.39 Non-Parametric Overall Estimates of Women's and Men's National Continuance Voting, 1896 to 1914

Table 5.14 Non-Parametric Estimates of Overall Prohibition Voting, 1911-1919

Year	Number Electorates	Palmquist Inflation Factor	Option	Option Vote/Total vote (True)	Women's Option Vote/ Women's Vote Non-Parametric Estimate	Standard Error	Men's Option Vote/ Men's Vote Non-Parametric Estimate	Standard Error	Overall Chi-Square	Significance
1911	61	78.5584	National Continuance	0.4106	0.4231	0.0353	0.4009	0.0275	190.2989	<0.0001
			National Prohibition	0.5330	0.5218	0.0368	0.5418	0.0287	149.4358	<0.0001
1914	64	81.9741	National Continuance	0.4870	0.4661	0.0337	0.503	0.0263	561.2014	<0.0001
			National Prohibition	0.4804	0.4983	0.0315	0.4663	0.0246	429.4027	<0.0001
1919 Special Licensing Poll	82	11.9204	National Continuance	0.4807	0.4342	0.0303	0.5668	0.0261	9140.9656	<0.0001
			National Prohibition	0.5095	0.5479	0.0279	0.432	0.024	6995.9460	<0.0001
1919	64	109.9326	National Continuance	0.4303	0.413	0.035	0.4454	0.0305	470.3028	<0.0001
			National Prohibition	0.4965	0.5362	0.0373	0.4619	0.0324	9140.9656	<0.0001

Note that some electorates are not included in the analyses and hence the values listed for the total vote for each option may not correspond to the national total. For example in 1911, counts of prohibition votes in Auckland, Wellington, Christchurch and Dunedin were not collected at electorate level, but for the whole city, thus combining a number of electorates. These groups are excluded from the analysis. A third option was offered at the December 1919 poll which accompanied the general election, state purchase and control. It received only about 6% of the votes, and I do not consider it here.

The null hypothesis for the chi-square test is that there was no difference between men's and women's support for the relevant option (i.e. $\beta_b = \beta_w$). The alternative hypothesis states that there was a difference (i.e. $\beta_b \neq \beta_w$). The significance level is set at 0.05.

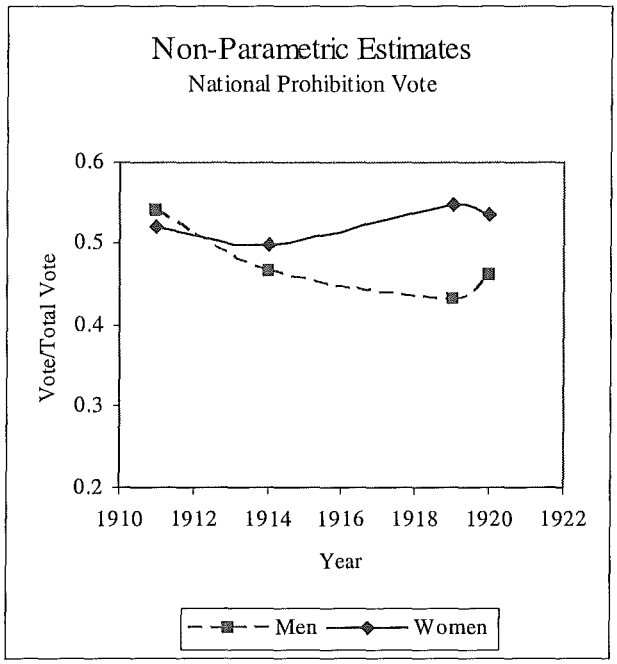

Figure 5.40 Non-Parametric Overall Estimates of Women's and Men's National Prohibition Voting, 1896 to 1914

The estimates for men's and women's support of the national continuance option in 1911 also suggest the opposite to the pattern seen in the local estimates. The overall estimates suggest that women were likely to support national continuance than men. Apparently 42% of women supported national continuance and 40% of men supported national continuance. The chi-square statistic, shown in Table 5.14, showed this difference was significant.

At first glance the estimates seem unlikely, especially in the face of opposite trends in all other years. It also seems unlikely that women's support for prohibition would be lower than men's in a year when, as Grigg noted, temperance workers made an 'all-out effort' to gain women's votes for prohibition options.[25] However, the diagnostics suggest a reasonably good fit for the 1911 estimates of men's and women's voting on the national options, and there is no reason to reject the estimates. There were a number of electorates that did not follow the overall estimates, but most did. (The electorate estimates are listed in Appendix Four.) Figure 5.43 and Figure 5.44 show the descriptive statistics for the electorate estimates for national options in 1911. Figure 5.43 shows that the median difference between women's and men's support for national continuance in 1911 is above 0, so that, according to the estimates, in most electorates, women were more likely to support continuance than men. The median difference between men's and women's national prohibition vote, shown in Figure 5.44, was

[25] Grigg, 'Prohibition and Women,' p.157.

less than 0, showing that, in most electorates, men were apparently more likely to support national prohibition. Tomography plots with electorate estimates are shown in Figure 5.41 and Figure 5.42.

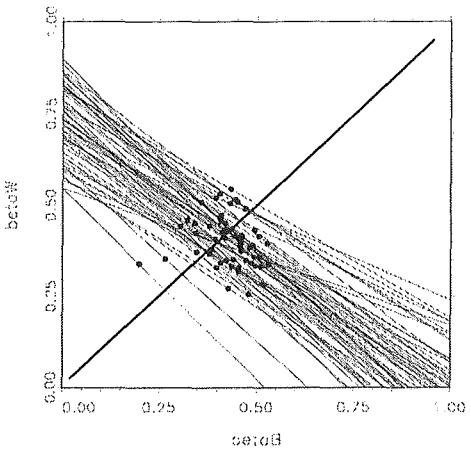

Figure 5.41 Tomography Plot for National Continuance Voting with Non-Parametric Electorate Estimates in 1911

(Women's Vote for the National Continuance Option / Women's Total Vote (β_{bj}) appears on the horizontal axis, and Men's Vote for the Option / Men's Total Vote (β_{wj}) is shown on the vertical axis.)

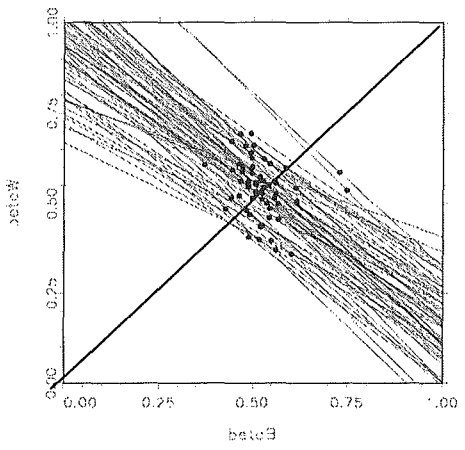

Figure 5.42 Tomography Plot for National Prohibition Voting with Non-Parametric Electorate Estimates in 1911

(Women's Vote for the National Prohibition Option / Women's Total Vote (β_{bj}) appears on the horizontal axis, and Men's Vote for the Option / Men's Total Vote (β_{wj}) is shown on the vertical axis.)

Both Grigg and Newman suggested that there was little evidence that women voted for prohibition in large numbers in 1911. The estimates support their claims. The estimates also suggest that women's support for prohibition fell in 1911.

Both men's and women's support of local no license apparently fell in 1911. This trend is shown in Figure 5.35. The estimate for women's support for local prohibition in 1908 is 0.5413, or 54%, but in 1911 the estimate is 0.4956, or 49%. This suggests a fall of four percentage points. Men's support for no license apparently fell from 50% to 45%.

However, when the estimates for local prohibition votes in 1908 are compared with the estimates for men's and women's votes for national prohibition in 1911, it is clear that men's support for prohibition has increased, while women's has decreased. Fifty per cent of men who voted at the 1908 poll supported local no license, but 54% of the men who voted at the licensing poll at the following election supported national prohibition. Of the women who

voted in 1908, 54% supported the local prohibition option, but in 1911, 52% of the women who voted supported national prohibition.

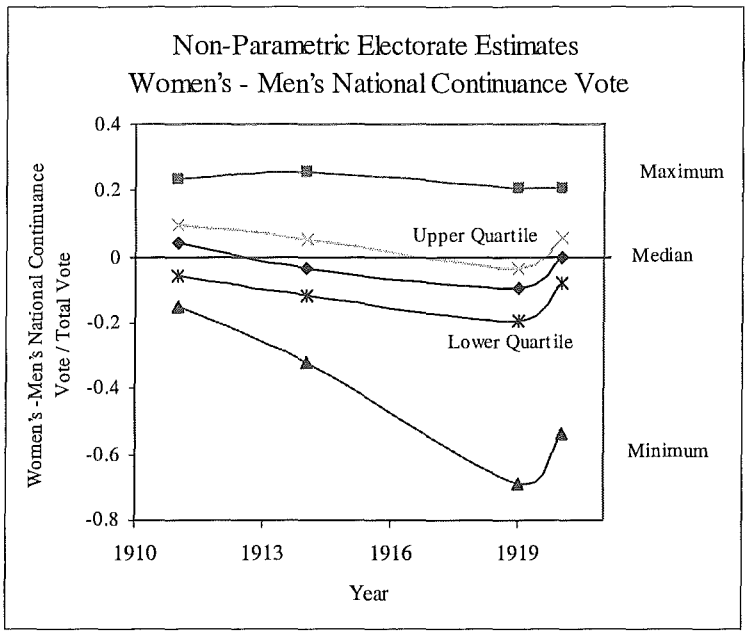

Figure 5.43 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's National Continuance Voting 1896 to 1914

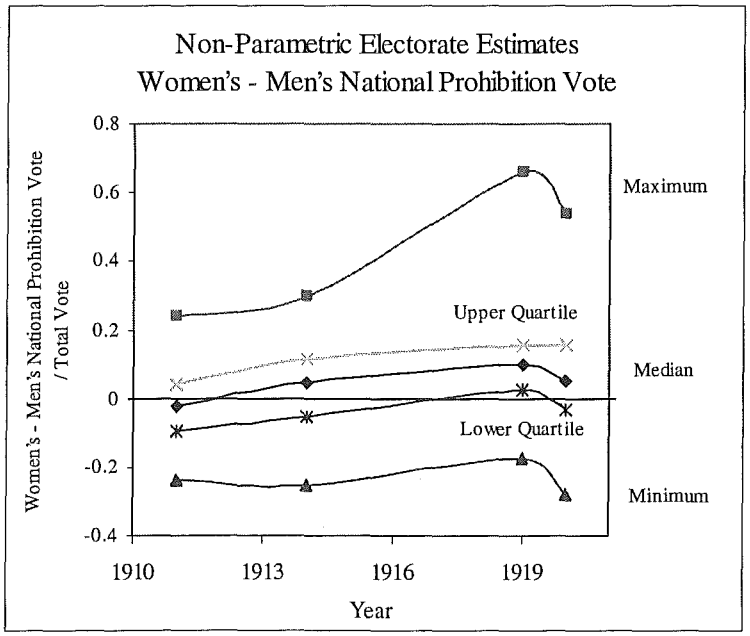

Figure 5.44 Descriptive Statistics for Differences between Non-Parametric Electorate Estimates of Women's and Men's National Prohibition Voting 1896 to 1914

What these differences suggest is that national prohibition had quite a different meaning to local options. Support for local prohibition fell between 1908 and 1911, but support for

national prohibition in 1911 was the highest of that at any prohibition poll. The estimates of men's and women's vote for national prohibition suggests that this was largely due to men's votes.

A clue to the cause of this shift might be found in Richard Newman's analysis of the poll. Newman argued that the peak in prohibition support in 1911 coincided with shifts in partisan politics, the emergence of Labour, strengthening of the Reform party and the decline of the Liberals. Newman suggested that prohibition meant different things to different sections, but that support for prohibition was a kind of symbolic protest, affirming political attitudes not captured by changing partisan politics of the period. Newman suggested that 'Farmers, merchants and labourers could join together in temperance rallies, [and] forget for a moment the issues that divided them'.[26] It may have been that prohibition had previously had a kind protest value for women voters. By voting for prohibition and reduction, many, though not all women may have been able to assert the importance of 'women's issues' that party politics failed to take into account. In 1911, when the old Liberal consensus finally fractured enough that Liberals failed to continue in government, the meaning of the prohibition vote complicated and changed and the link between women and prohibition faltered. We need to understand how parties invoked both femininity and masculinity in 1911, and how men and women responded to temperance debates. The estimates for men's and women's national prohibition vote in 1911 confirm that 1911 was key year in the history of New Zealand elections, since they indicate the reverse to the usual pattern suggesting that men's support for prohibition exceeded women's.

After 1911, the old pattern revived, and the estimates suggest that women were more likely to vote for prohibition than men in 1914 and the two polls of 1919, as shown in Table 5.14, Figure 5.41 and Figure 5.42.

The special licensing poll held in April of 1919 shows an especially strong gender pattern, with the estimates suggesting that in three quarters of electorates men were more likely to support continuance, and women more likely to support prohibition, as shown in Figure 5.43 and Figure 5.44. The strong pattern evident at this poll owes something to improved data. At this poll the votes of armed forces returning from overseas service were specially enumerated in the official results, with the votes of armed forces personnel in the United Kingdom, France, Egypt, Samoa, New Zealand and on troop-ships listed separately. Very few women went on overseas service in the First World War, and the forces votes, were, in the large

[26] Newman, 'New Zealand's Vote for Prohibition', p.66.

majority cast by men. The exact proportion of women amongst the forces voters is not known, but since only 550 women nurses went on overseas service during World War I, compared with over 100,000 male members of the armed forces,[27] it was unlikely that more than 1% of the forces votes were cast by women. At this poll then, there were six groups of voters, where the proportion of women amongst the total was very small. Hence for the six groups of forces voters, x_j, women's votes/total votes, was set at 0.01.

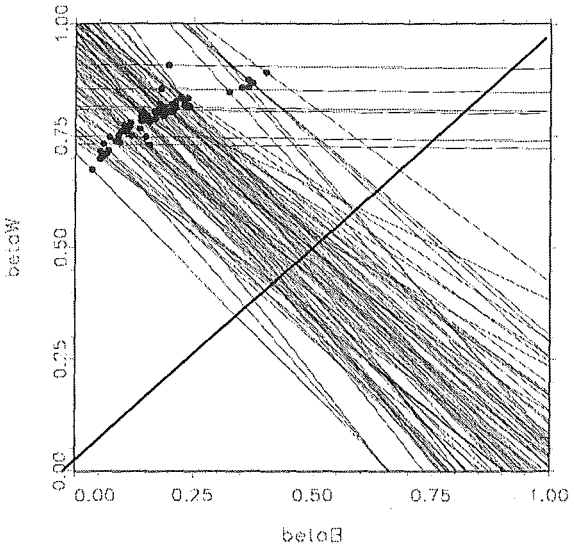

Figure 5.45 Tomography Plot for Continuance Voting with Parametric Estimates in 76 Electorates and 6 Groups of Armed Forces Voters in April 1919 (Women's Continuance Vote / Women's Total Vote (βbj) is shown on the horizontal axis and Men's Continuance Vote / Men's Total vote (βwj) is shown on the vertical axis.)

The existence of all-men groups (or what statisticians have called homogeneous groups) greatly increases the efficacy of ecological inference. This is reflected in the low value of the Palmquist inflation factor for the 1919 poll, which was 11.9204, substantially lower than at any other elections. The contribution of homogeneous groups is evident in the tomography plot for continuance voting, shown in Figure 5.45. The forces votes are reflected by the (almost) horizontal lines, indicating the high certainty regarding the votes of men amongst those groups of military personnel.

The low inflation factor suggests that the King's parametric method might perform better with this data-set, although Palmquist has suggested that an inflation factor under three ensures

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[27] *NZOYB*, 1919, pp.255-257; Donald Denoon, Philippa Mein-Smith, and Marjorie Wyndham, *A History of Australia, New Zealand and the Pacific* (Oxford: Blackwell, 2000), pp.282-283; Jane Tolerton, *Ettie: A Life of Ettie Rout* (Auckland: Penguin Books, 1992), pp.102-105.

reasonable estimates, [28] and at 11.9 the inflation factor remains high. King's parametric method places the electorate estimates at the junction between the horizontal lines on the tomography plot and the other lines, as shown in Figure 5.45, which shows the parametric estimates on the tomography plot. The parametric method produces estimates that suggest a massive difference between men's and women's votes. The overall estimates are shown in Table 5.15. The overall parametric estimates suggest that only 17% of women supported National Continuance, but that 79% of men supported that option. A similar discrepancy occurs in the estimates of men's and women's prohibition support. Such large discrepancies seems unlikely, although the data provide much stronger evidence for large differences than data for previous polls.

Table 5.15 1919 Special Licensing Poll Estimates for Women's and Men's Overall National Continuance and National Prohibition Voting

1919 Option	Method (Palmquist Inflation Factor = 11.9204 N=82)	Women's Option Vote / Women's Vote	Standard Error	Men's Option Vote / Men's Vote	Standard Error
National Continuance	Overall Bounds	(0.0332, 0.9030)		(0.1630, 0.9122)	
	Parametric	0.1712	0.0155	0.7933	0.0133
	Non-Parametric	0.4342	0.0303	0.5668	0.0261
National Prohibition	Overall Bounds	(0.0859, 0.9587)		(0.0782, 0.8298)	
	Parametric	0.8188	0.0145	0.1987	0.0125
	Non-Parametric	0.5479	0.0279	0.4320	0.0240

Members of the armed forces were much more likely to support continuance than civilian voters, and much less likely to support prohibition. Eighty percent of the forces voters supported continuance, but civilian voters were less emphatic, with only 49% supporting continuance. Only 19% of the forces voters supported prohibition, compared with 51% of other voters. It seems likely that the votes cast by the armed forces would have been influenced as much by soldiers' overseas war service, as by their gender. Hence, although the forces votes were homogeneous by gender, there were other factors that distinguished them from groups of civilian voters, and shaped their preferences regarding prohibition. The parametric method puts much weight on the forces votes, borrowing strength from them to

[28] Bradley Palmquist, 'Unlocking the Aggregate Data Past - Which Key Fits?,' *Historical Methods* 34, no. 4 (2001): p.167.

estimate electorate specific prohibition preferences for men and women, but the results are unlikely. The parametric method effectively puts too much weight on the forces votes and does not take into account overseas service.

The non-parametric method, which borrows strength from electorates more circumspectly, provides less polarised figures. Non-parametric electorate estimates are shown in Figure 5.46, and the overall estimates in Table 5.15. The non-parametric estimates suggest that overall 43% of women supported national continuance, and 57% of men. This is a smaller, though still significant difference. (The chi-square statistics for the overall non-parametric estimates are shown in Table 5.14.) Non-parametric estimates of prohibition support showed a similar but reverse significant difference, with 55% of women apparently supporting prohibition and 43% of men.

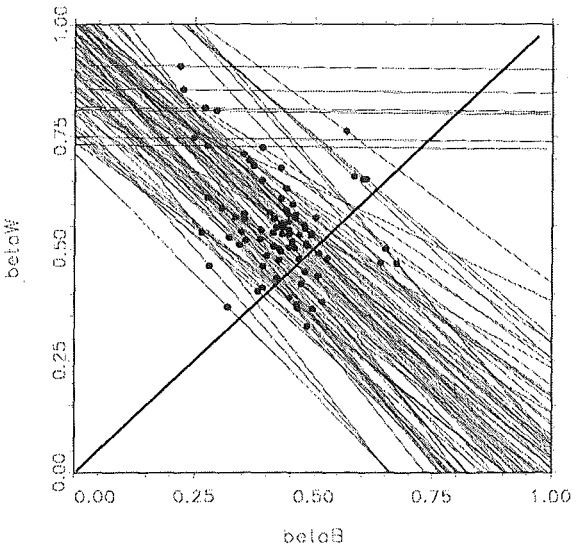

Figure 5.46 Tomography Plot for Continuance Voting with Non-Parametric Estimates for 76 Electorates and 6 Groups of Armed Forces Voters in April 1919 (Women's Continuance Vote / Women's Total Vote (β_{bj}) is shown on the horizontal axis and Men's Continuance Vote / Men's Total vote (β_{wj}) is shown on the vertical axis.)

Despite the low inflation factor, the overall and electorate bounds on men's and women's votes for the options of national continuance and national prohibition remained wide. Hence the standard errors have not reduced for the non-parametric overall and electorate estimates in 1919. However the position of the non-parametric electorate estimates as shown in Figure 5.46 is reasonable.

The results from the April 1919 poll suggest two things. The first is that the non-parametric method may have under-estimated gender differences in prohibition voting at both local and national polls. The addition of mostly male groups to the data-set has produced more polarised estimates of men's and women's votes at the 1919 special licensing poll. However, such a pronounced difference between men's and women's opinions over time would surely have left its mark in other types of evidence. Grigg reviewed a range of evidence, but found nothing to suggest that women's support for prohibition substantially exceeded women's. For example, high interest in prohibition would likely have encouraged women to vote at prohibition polls, which it did not in general. In 1894, women's voting rate at the prohibition poll was surprisingly low, and at other polls it was little different from their voting rate at candidate polls. Moreover, women were no more involved in organisations promoting temperance than men. The Women's Christian Temperance Movement was only small, as Phillida Bunkle has also noted, and the influential temperance organisation, the New Zealand Alliance had only few women members.[29] This suggests that the tendencies suggested by the overall estimates, that women were significantly, but not substantially, more likely to support prohibition, and that men were significantly, but not substantially more likely to support continuance, are plausible. Women's support for reduction seems to have been substantially higher than men's, and this relationship needs further research.

The second point is that uncertainty remains high in both of King's methods for ecological inference, as reflected in the standard errors. King's non-parametric estimates have provided reasonable, but uncertain, estimates of party and prohibition voting. As other researchers have suggested, King's methods only perform well when the bounds substantially narrow the possibilities, which is not the case for data classified by gender from any New Zealand elections.[30] While King's parametric and non-parametric methods provide an advance on previous techniques used to analyse aggregate data, they do not fully overcome the limitations of information loss in aggregate data. This underscores the fact that the results from any

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[29] Phillida Bunkle, 'The Origins of the Women's Movement in New Zealand: The Women's Christian Temperance Union 1885-1895,' in *Women in New Zealand Society*, ed. Phillida Bunkle and Beryl Hughes (Auckland: George Allen and Unwin, 1980); Grigg, 'Prohibition and Women.'

[30] See for example Paul Bourke, Donald DeBats, and Thomas Phelan, 'Comparing Individual-Level Returns with Aggregates,' *Historical Methods* 34, no. 3 (2001): p.131.and *D. Stephen Voss, Ecological Inference and Contextual Research: In Pursuit of the Southern Cross-Tab (*Prepared for the New Advances in Ecological Inference Conference, Centre for Basic Research in the Social Sciences, Cambridge, Ma, June 2002*)* (2002, accessed 25 June 2002); available from www.cbrss.harvard.edu/events/eic/papers/voss.pdf.

method for ecological inference, including those reported here, are estimates, and may not equal the true values.

The non-parametric method has, however produced plausible estimates of men's and women's prohibition voting that show a consistent and coherent pattern over time, a pattern that is compatible with existing accounts of the period. The generation of these estimates has provided new evidence regarding the interaction between gender and voting at New Zealand elections in the early twentieth century.

The analysis in this chapter has concentrated on differences between men and women as a whole as reflected in the estimates for men's and women's preferences for party and prohibition options. This analysis can be seen as one step in research on the relationship between gender and voting. The next step would be to return to local studies to explain some of the trends at the overall level, and also to tease out differences. A close study of the 1893 election in Christchurch suggested that differences between women and men were as important as similarities. Both Liberal women and conservative women organised. Men disagreed over the need for prohibition. In a sense the estimates are still subject to the ecological fallacy since they group together diverse sub-groups of women to estimate 'women's votes', and group together diverse sub-groups to men to estimates 'men's votes'. Such sub-groups can only be retrieved and understood through examining local conditions, since the available quantitative data encapsulate an entire electorates, without identifying political constituencies within those electorates.

Despite these qualifications, this analysis has confirmed the hypotheses that gender mattered in partisan politics, and that the relationship between gender and party vote varied across time and space. Gender differences were specific to particular contests and contexts. However, in most years, there was a significant overall relationship between gender and party voting, as reflected in the chi-square statistics. This suggests that at most elections party vote was polarised by gender, suggesting the original hypothesis needs to be modified. There were significant, though not large differences, between men's and women's party preferences at most elections from 1893 until 1919.

The overall trend suggests that women were more likely to support opposition candidates from 1899 to 1908, but that men were more likely to support the Reform party after that time. The Liberal trend was the reverse, men's preference for Liberals exceeded women's in the early period, and women were more likely to vote for Liberal candidates after 1911. The relationship between prohibition voting and gender was clearer, with women apparently more

likely than men to vote for prohibition at many, though not all elections, and in most electorates at those elections. Gender did influence voters' choices at elections from 1893 until 1919.

Conclusion

This thesis claims that gender was a significant factor at New Zealand elections from 1893 until 1919. Gender difference was evident across time and space. Men's and women's voting rates differed, with men more likely to cast a vote from 1893 until the 1940s, when men's and women's voting rates reached virtually the same level. Estimates of men's and women's party vote suggest that men's and women's party preferences were not the same from 1893 until 1919, with the extent and nature of that difference varying across electorates and elections. The overall pattern largely hid the variation, but indicated that until 1908, both men and women preferred the Liberals overall, but men's preference for the Liberals exceeded women's. Women were more likely than men to support the opposition in this period. After 1911, three party politics intervened, and no party won a majority of men's or women's votes overall. However, men's preference for the Reform party exceeded women's preference for that party, and women were more likely to support the Liberals than men. The pattern of prohibition voting was clearer. Estimates of men's and women's prohibition votes suggest that women were consistently more likely to support prohibition measures than men, although women did not necessarily favour prohibition over continuance. These findings suggest that gender cannot be ignored in accounts of electoral politics from 1893 until 1919.

This analysis identified 1911 as a key election of the period. The number of electorates where women's turnout exceeded men's peaked in 1911 and the estimates suggest patterns of men's and women's party preferences shifted at this point. Men's preference for conservative candidates exceeded women's for the first time, and it was the last election of the period at which men's preference for Liberal candidates would exceed women's. Furthermore, it was the only election at which men's support of prohibition apparently exceeded women's. These findings confirm existing accounts of electoral politics which have concentrated on the shifts in party alignment that occurred around 1911. This analysis suggests that gender played an important role in the shifts in voting patterns in 1911.

Although further research is needed on local election campaigns, including those of 1911, a close study of the 1893 election in Christchurch suggested that political organization was gendered, with women preferring women-only political groups at that election. This finding supports the conclusions of studies of party organization in later years, which also found that women separately organized separately.[1] Gender also threaded through political debates, with

[1] Liz Gordon, 'A Place in the Sun: Women in the New Zealand Labour Party' (1988) Unpublished manuscript; Barry Gustafson, *The First Fifty Years: A History of the New Zealand National Party*

understandings of gender and gender difference being invoked to support a number of different political positions by Christchurch voters and candidates. Some positions, such as prohibition, were more frequently associated with women, but it was clear that not all women supported prohibition. Gender difference was highlighted in newspaper accounts as writers lamented or rejoiced in women's participation in the election campaign. It was also highlighted in official election results where men's and women's participation were separately listed, enabling a quantitative analysis of gender differences in participation and voting choices at later elections.

Analysis of the Christchurch campaign in 1893 suggests that existing accounts of women's entry into election politics need to be revised. Women did face barriers to participation, notably from newspapers and male candidates who showed a 'persisting resistance' to women's involvement. However, women's enthusiasm for electoral politics revealed itself in the formation of women's organizations. These organizations facilitated women's registration, organized women to canvass and the canvassing of women, and mobilized women in support of the various male candidates. Olssen's claim that Caversham women were marginalized does not carry across to Christchurch, where there was a much more mixed picture. The overall pattern suggests that women were involved in electoral politics despite the barriers.

The overall pattern of men's and women's voting rates after 1893 does, however, support the marginalization hypothesis. Women's turnout remained significantly lower than men's. However, the difference was not large compared with other countries. Moreover, closer analysis of the pattern suggested that women's turnout increased at periods when women were more active in political organizations. This suggests that lower rates of turnout did not stem merely from the resistance of the male political establishment.

These claims are substantive ones that revise the existing literature, but the thesis makes a further claim which is a methodological one. When asking questions about the voting behaviour of social groups, analysts must take into account the ecological fallacy if using official election data or other data based on electorates. The ecological fallacy states that

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(Auckland: Reed Methuen, 1986); Susan Jane Kedgley, 'Ladies in the Backroom: A Study of Women Party Activists in the National and Labour Parties' (Master of Arts, University of Otago, 1972); Melanie Nolan, 'Gender and the Politics of Keeping Left: Wellington Labour Women and Their Community, 1912-1949,' in *Communities of Women: Historical Perspectives*, eds., Barbara Brookes and Dorothy Page (Dunedin: University of Otago Press, 2002).

patterns evident at electorate level do not necessarily correspond to those at the sub-electorate level.

Techniques for ecological inference are the most appropriate methods for use on data that describes groups rather than individuals. These methods use the information in the group data to estimate the voting patterns of individuals or sub-groups. In this thesis ecological inference was used to infer men's and women's party votes and their votes at the local and national licensing polls between 1893 and 1919. Other methods are much less reliable in the face of the ecological fallacy. Correlations need to be interpreted with great care, since there is no guarantee that correlations based on group data reflect individual behaviour. A positive correlation between women's turnout and the prohibition vote is no basis for claiming that women voted for prohibition. Dividing electorates into like sections and tracing sectional votes, such as Robert Chapman has done, is less problematic, but such approaches easily lend themselves to incorrect interpretation. In any case, techniques for ecological inference are much more informative, since they provide estimates of the voting patterns of social groups at both local and overall levels. The provision of local estimates is a distinct advantage of methods for ecological inference, since it allows the identification of unusual electorate results, and the incorporation of knowledge about local circumstances into the overall explanation. Moreover, it is the electorate-specific results that are important at elections, since it is these results, rather than the overall results, that determine the make-up of parliaments.

This thesis considers a number of methods for ecological inference. A trial found that the methods most discussed by historians, namely Goodman's ecological regression and King's parametric EI, were not appropriate for application to data classified by gender. The trial identified three methods that produced estimates close to the known true values for men's and women's turnout over a number of elections. These methods were King's non-parametric method, Chambers and Steel's semi-parametric method, and the recently developed homogeneous method. The non-parametric method has received very little attention in the literature, and the semi-parametric and homogeneous methods have, to date, not been trialed, other than by their authors. Further work is needed to determine the performance of these methods under varying conditions. In particular, further work is needed to identify the impact of aggregation bias on estimates produced by these methods.

While the homogeneous method performed best overall, the non-parametric method is easily implemented, and so this method was used to estimate men's and women's party and prohibition votes, and it gave plausible results. By identifying 1911 as a stand-out year, the estimates confirmed the periodisation of electoral politics identified by other historians. The

estimates provided evidence for new claims about the relationship between gender and party voting identified above. The variation in electorate estimates also confirmed the hypotheses drawn form qualitative sources, namely that the actual relationship between gender and politics varied from place to place. However, the overall estimates did suggest that, taking the country as a whole, men's and women's preferences differed, and that these preferences were consistent over time.

Further work might refine the actual values of estimates discussed in this thesis. Comparison of estimates produced by the non-parametric method with estimates produced by the semi-parametric and homogeneous methods could be informative. The homogeneous method deserves particular attention since it performed best in the trial of the three methods. It would also be worth exploring methods based on m x n tables, so that the three way contests of the 1911 can be more closely modeled. Men's and women's responses to Labour's entry into electoral politics, which have not been considered in this thesis, could then be further assessed.

This thesis highlights a number of areas for future research on New Zealand electoral politics. There is a need for further studies of local election campaigns, and the role of gender within those campaigns. The invocation of gendered ideals by politicians and voters during electoral campaigns needs further research, as does the way men and women organized. There has been little research on Liberal, Reform or opposition organization at the local level between 1893 and 1919. Greater understanding of relationships between gender and political organization and debates is vital to understanding the relationship between gender and voting. Further analysis of local election campaigns will allow the further testing of the claim that gender differences in election politics, including voting, can be explained by reference to local campaigns.

The need for further local studies applies across the board, but it is particularly relevant to the elections of 1893 and 1911. Our understanding of the role of gender in the 1893 election would be enhanced by studies of rural electorates and North Island electorates. It could also be worthwhile to look at electorates identified as outliers at that election, namely Marsden, Clutha, Patea, Waipa, Inangahua and Wakatipu. A range of local studies could also help explain the changes in electoral politics that occurred in 1911. Trends in men's and women's participation and voting preferences suggested that 1911 was an unusual year, reflecting shifts in party politics that occurred at that time. The role of gender in the organization and debates of that election needs to be teased out, particularly with regard to prohibition. The role of

Reform Party organization, including the role of women in the Reform Party, also needs further analysis.

There are a number of areas where applying techniques of ecological inference to official election data would provide new evidence to assess New Zealand's electoral politics. Methods for ecological inference could be used to assess rural and urban voting from 1881 until 1943, and gendered voting from 1922 until 1954. Estimates of men's and women's party and prohibition voting from 1922 until 1954 could be generated as the basis for a study of the relationship between gender and voting over that period. Men's and women's party voting deserves particular attention. From 1935 until 1954 elections were largely two party contests, making estimation of men's and women's party votes using ecological inference more straightforward than in the earlier period. Moreover, there is a rich archive of election propaganda produced by the Labour and National governments. Much of this propaganda does invoke gender ideals and some appeals specifically to women. As Melanie Nolan has suggested, after World War II 'National and Labour were locked into an arms race on domesticity, each trying to outdo the other in their defense of the home and the family.'[2] Labour's pamphlet, *Women's Place in the Sun*, produced for the 1946 election, and National's *A Family Affair* issued in 1949 are just two examples of the literature of the period. In addition, both Labour and National had separate women's groups over this period, and the relationship between separation and integration of men and women in party organizations and patterns of electoral participation and voting preferences could be further examined. After 1954, the official election data did not record men's and women's voting rates separately, and analysis of the impact of gender on voting must rely on other sources.

Secondly, techniques for ecological inference could be used to reassess claims about rural and urban voting patterns. Data on rural and urban electorate populations began to be collected in 1881 when the country quota was introduced. The quota was abolished in the 1940s, but the data that does exist has not been fully exploited. Chapman's work has dominated the study of early to mid-twentieth century electoral politics. He has claimed that the rural-urban split was the crucial division of the period, albeit modified by class, and other historians have made similar claims. However, a plot of the 1893 Liberal vote against the rural population proportion shown in Chapter Four (Figure 4.7) suggested that the number of votes Liberal candidates received in that election were not shaped by the number of voters living in rural areas, a finding which goes against most historians' claims. The rural population proportion is

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[2] Melanie Nolan, *Breadwinning: New Zealand Women and the State* (Christchurch: Canterbury University Press, 2000), p.193.

a blunt measure that is not as finely grained as Chapman's categorization. However, further research is needed. Methods for ecological inference provide an advance on Chapman's methods since they allow the actual estimation of rural and urban voting patterns. Inferring rural and urban voting patterns using methods for ecological inference could confirm or modify his conclusions. The data on rural and urban voting provides a particularly good basis for ecological inference since the data-set includes a number of all-rural and all-urban electorates, increasing its purchase.[3]

The relationship between rural and urban voting could be further tested by using techniques for ecological inference to estimate the voting rates of rural men and rural women and urban men and urban women.[4] This would allow a stronger analysis of the way gender interacted with other factors to shape electoral participation. There is also room for a closer analysis of estimates of men's and women's party and prohibition voting. In particular, an analysis of the patterns of men's and women's preferences across rural and urban electorates is needed. One possibility is to divide electorates into the sections defined by Chapman, and then to assess if men or women in each section behaved similarly.

Techniques for ecological inference could be used to assess the voting patterns of other social groups. However, while data on gender and rural and urban voters is easily found in official election results and the reports of the Representation Commission, data on other variables is not so readily available. Potential sources include electoral rolls and census reports. Electoral rolls could provide information about occupation, and there is potential for a class-based analysis. Disaggregating and reaggregating electorate boundaries to match the geographical boundaries used by census officials may allow the use of census data. However, it is vital to only apply ecological inference to social groupings that might be relevant politically. This

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[3] For example, if estimating rural and urban votes for the Liberal party, we would have, for each electorate, x_j = rural population proportion, t_j = proportion of votes received by the Liberal candidate, β_{bj} = proportion of votes cast by rural voters for the Liberal candidate, β_{wj} = proportion of votes cast by voters living in urban areas for the Liberal candidate.

[4] This would require two separate analysis, one to estimate the turnout of men in rural and urban electorates, and one to estimate the turnout of women in rural and urban electorates. The most simple option would be, for each electorate, x_j = rural population proportion, t_j = women's (or men's) turnout, β_{bj} = proportion rural women (or men) that vote, β_{wj} = proportion urban women (or men) that vote. However, this does not take into account the fact that urban areas tend to have more women than rural areas, and it may be necessary to make adjustments to the value of the rural population proportion to account for this difference.

underscores the need for studies of election campaigns to ascertain whether 'passive unities' might form political constituencies.

Further research might also tease out how gender interacted with other factors to influence election results and rates of participation, and indicate the significance of gender compared with other factors. The determinants of the known electorate party or prohibition vote could be determined using regression-based models. Variables that could be included in such a model include the level of men's and women's turnout, the rural population proportion and shifts in electorate population. Initial trials using logistic regression made in the process of research for this thesis suggested that the degree to which women registered was a significant factor in Liberal success in 1893, but more research is needed. John Turner used multiple regression to investigate the impact of women's entry into electoral politics in England in the 1920s, concluding that there was not enough evidence to suggest that new women voters had mostly voted Conservative as many commentators had suggested.[5] It should be noted that interpretation of the results of such regression models need to be interpreted very carefully in the light of the ecological fallacy. The significance of women's voting rate in Liberal success does not necessarily suggest that women voted for the Liberals.

Regression could be more appropriately applied to determine the factors influencing men's and women's voting rates, which are known. This type of analysis could be particularly informative in 1893, when it could suggest which factors shaped women's decision to register and to vote at their first election. Regression based models could also be used to determine what kind of factors influenced men's and women's party and prohibition votes, by using the estimates of those preferences generated by ecological inference as the independent variable in a regression model. Such an analysis might indicate how much urban or rural location affected men's or women's votes for prohibition or parties.

Much work remains to be done on the impact of gender and other factors on electoral politics, at both a national and local level, but this thesis has shown that gender can no longer be ignored in studies of electoral politics from 1893 until 1919. By approaching the question of gender and voting through a local case-study and through an examination of trends across

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[5] John Turner, 'Sex, Age and the Labour Vote in the 1920s,' in *History and Computing II*, eds., Peter Denley, Stefan Fogelvik, and Charles Harvey (Manchester: Manchester University Press, 1989). See also John Turner, 'The Labour Vote and the Franchise after 1918: An Investigation of the English Evidence,' in *History and Computing*, eds., Peter Denley and Deian Hopkin (Manchester: Manchester University Press, 1987).

space and time, this thesis has indicated that gender difference was evident at a number of levels of electoral politics. It was evident in the organization and debates of election campaigns, and it was evident at the polling booth. Men were more likely to vote than women. The party preferences of men and women differed significantly, and women were more likely to support prohibition than men. The separate recording of men's and women's turnout rates in official election results reflected the importance of gender in shaping those results. Existing accounts of electoral politics need to be modified to include gender, a factor which shapes both the details of men's and women's lives and broader social patterns.

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Given that the analysis of the thesis is on so many different levels, for the sake of clarity, the primary sources are divided by topic. Literature on the ecological fallacy is separated from other secondary literature.

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Appendix 1

The Chi-Square Statistic and the Fisher Exact Test

To test whether there is a relationship between gender and voting rates, or between gender and voting preferences, the chi-square statistic can be used. The chi-square statistic is used to test for independence between the two factors in two by two tables. The statistic measures the difference between the observed frequencies in the internal cells, and "expected frequencies", that is, the counts that would be expected under a null hypothesis of independence, or no relationship between the two factors.

Consider the following table, where the values in all cells are known:

Men's and Women's Turnout in 1893

1893	Vote	Don't Vote	Total
Women	v_{fv} = 90290	v_f - v_{fv} = 62230	v_f = 152520
Men	v_{mv} = 129697	v_m - v_{mv} = 54241	v_m = 183938
Total	v_v = 219987	N - v_v = 116471	N = 336458

v_{fv} = Number of women who cast a vote

v_f = Total number of women registered on the electoral roll

v_{mv} = Number of men who cast a vote

v_m = Total number of men registered on the electoral roll

v_v = Total number of votes cast

N = Total number of registered voters.

The null hypothesis is that men and women were equally like to cast a vote, that is, turnout is independent of gender. Under that hypothesis, the expected value of v_{fv} would be:

$$\hat{v}_{fv} = \frac{(v_f)(v_v)}{N} = \frac{152520 \times 219987}{336458} = 99722.5$$

Other expected frequencies can be calculated using the formula

$$\hat{v}_{ij} = \frac{(v_i)(v_j)}{N},$$

where v_{ij} is the frequency in the ith row and the jth column of the table.

The alternative hypothesis is that turnout is dependent on gender.

The chi-square statistic is defined

$$\chi^2 = \sum_j \sum_i \frac{(v_{ij} - \hat{v}_{ij})^2}{\hat{v}_{ij}}.$$

This statistic is distributed according to the chi-square distribution with k degrees of freedom, where k = (number of rows – 1) x (number of columns – 1).

In this example χ^2 = 4802.2250, and k=1.

χ^2 is larger when the difference between the observed and expected frequencies is larger.

To test the significance of the result, the question is: how likely are the observed frequencies if the null hypothesis is true? Under the χ^2 distribution, critical values can be determined for different probabilities, α. If the null hypothesis is true, α is the probability that χ^2 will exceed the tabulated value. For α =0.05 and one degree of freedom, the critical value of the χ^2 distribution is 3.841. If the null hypothesis is true, there is a 0.05 probability that χ^2 will exceed 3.841.

Here the calculated value of χ^2 is 4802.2250, which exceeds the critical value, so the null hypothesis can be rejected and the alternative hypothesis accepted. Turnout is dependent on gender.

This example considers the total turnout in all electorates, but chi-square statistics can also be calculated for each electorate, as shown in Chapter Three, Table 3.

For further details regarding the chi-square statistic see Zar, Jerrold H. *Biostatistical Analysis.* 4 ed. Upper Saddle River, New Jersey: Prentice Hall, 1999, pp.462-464,486-489.

The Fisher Exact Test can be applied when one-tailed hypotheses are of interest. For example, if the null hypothesis is that women's turnout was greater than or equal to men's turnout in 1893, the alternative hypothesis would be that women's turnout was lower than men's in 1893.

The Fisher exact test is based on the hypergeometric probability

$$P = \frac{\binom{v_f}{v_{fv}}\binom{v_m}{v_{mv}}}{\binom{N}{v_v}}$$

This is the probability of the observed table occurring by random chance, given the row and column totals, if the null hypothesis were true.

This probability is calculated for the observed table, and for each table with a value of v_{fv} more extreme than the observed value. The probabilities of the observed table and more extreme tables are summed, and if this value is less than of equal to the significance level α then the null hypothesis can be rejected.

A two sided fisher exact test can also be performed but is not utilised in this thesis.

For further details on the Fisher Exact Test, see Zar, *Biostatistical Analysis*, pp.543-555.

Appendix 2

Non-Parametric Electorate Estimates of Women's and Men's Party Voting, 1896 to 1919

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1896	Ashburton	0.3132	0.2876
1896	Awarua	0.4337	0.7637
1896	Bay of Islands	0.3529	0.7218
1896	Bay of Plenty	0.4794	0.4771
1896	Buller	0.4722	0.5692
1896	City of Nelson	0.5338	0.5549
1896	Eden	0.4376	0.4997
1896	Egmont	0.498	0.4278
1896	Ellesmere	0.5383	0.6286
1896	Franklin	0.4716	0.4142
1896	Geraldine	0.481	0.5666
1896	Grey	0.6574	0.827
1896	Hawera	0.3765	0.2686
1896	Hawke's Bay	0.5146	0.3171
1896	Invercargill	0.2584	0.4699
1896	Kaiapoi	0.4613	0.4738
1896	Manawatu	0.5227	0.3568
1896	Manukau	0.5844	0.4846
1896	Masterton	0.4763	0.5816
1896	Mataura	0.5135	0.4477
1896	Napier	0.3664	0.4473
1896	Oamaru	0.6223	0.583
1896	Ohinemuri	0.4327	0.8861
1896	Otaki	0.488	0.6321
1896	Palmerston	0.5153	0.5061
1896	Parnell	0.4671	0.4792
1896	Patea	0.5136	0.4198
1896	Rangitikei	0.4681	0.465
1896	Riccarton	0.4146	0.4612
1896	Selwyn	0.4795	0.4663
1896	Suburbs of Wellington	0.5711	0.4933
1896	Taieri	0.4416	0.6906
1896	Taranaki	0.4816	0.4
1896	Thames	0.4854	0.5679
1896	Timaru	0.6386	0.538
1896	Tuapeka	0.4955	0.5071
1896	Waiapu	0.5152	0.5664
1896	Waihemo	0.5	0.6363
1896	Waikouaiti	0.4273	0.4872
1896	Waipawa	0.4565	0.4828
1896	Wairarapa	0.5521	0.3941
1896	Wairau	0.5166	0.4981
1896	Waitemata	0.5041	0.4657
1896	Wakatipu	0.5476	0.3584
1896	Wanganui	0.4793	0.5053

Year	Electorate	Non-Parametric Estimate of Women's Opposition Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Opposition Votes/ Total Votes Cast by Men
1896	Ashburton	0.3809	0.354
1896	Ashley	0.493	0.3386
1896	Avon	0.3324	0.3833
1896	Awarua	0.5042	0.2755
1896	Bay of Islands	0.5455	0.3207
1896	Bay of Plenty	0.4604	0.5614
1896	Bruce	0.6122	0.7216
1896	Caversham	0.0616	0.0767
1896	City of Nelson	0.5215	0.3965
1896	Clutha	0.5041	0.5631
1896	Eden	0.5915	0.4737
1896	Egmont	0.5176	0.2556
1896	Ellesmere	0.4461	0.382
1896	Franklin	0.5077	0.6016
1896	Geraldine	0.4983	0.4488
1896	Hawke's Bay	0.4566	0.6993
1896	Kaiapoi	0.5071	0.5537
1896	Lyttelton	0.3245	0.4096
1896	Manawatu	0.5026	0.3335
1896	Manukau	0.4278	0.5034
1896	Marsden	0.5236	0.3708
1896	Masterton	0.5204	0.4201
1896	Mataura	0.5133	0.5345
1896	Motueka	0.4876	0.3375
1896	Napier	0.6266	0.5587
1896	Oamaru	0.4187	0.3823
1896	Otaki	0.4795	0.3905
1896	Palmerston	0.51	0.4751
1896	Parnell	0.2668	0.4322
1896	Patea	0.4199	0.6135
1896	Rangitikei	0.4452	0.5766
1896	Riccarton	0.5602	0.5599
1896	Selwyn	0.4833	0.5543
1896	Suburbs of Wellington	0.4945	0.4481
1896	Taieri	0.5046	0.3447
1896	Taranaki	0.5244	0.4324
1896	Timaru	0.3689	0.4552
1896	Tuapeka	0.4833	0.5045
1896	Waiapu	0.5051	0.4212
1896	Waihemo	0.475	0.3792
1896	Waikato	0.5948	0.7572
1896	Waikouaiti	0.1808	0.1959
1896	Waipawa	0.4963	0.5501
1896	Wairarapa	0.4547	0.6019
1896	Waitemata	0.3964	0.5617

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1896	Westland	0.6599	0.8234
1899	Ashley	0.4295	0.7319
1899	Avon	0.4849	0.5516
1899	Awarua	0.731	0.8124
1899	Bay of Islands	0.5543	0.4872
1899	Bay of Plenty	0.4505	0.4783
1899	Bruce	0.5123	0.401
1899	Caversham	0.7004	0.5393
1899	City of Nelson	0.5457	0.5828
1899	Clutha	0.493	0.2564
1899	Eden	0.5108	0.4905
1899	Egmont	0.4794	0.5576
1899	Ellesmere	0.4813	0.4877
1899	Franklin	0.4212	0.2846
1899	Geraldine	0.5866	0.7116
1899	Grey	0.44	0.6756
1899	Hawera	0.5246	0.3437
1899	Invercargill	0.517	0.5387
1899	Kaiapoi	0.5443	0.5437
1899	Manawatu	0.5129	0.5269
1899	Manukau	0.472	0.5308
1899	Masterton	0.5312	0.7253
1899	Mataura	0.4731	0.551
1899	Motueka	0.562	0.7409
1899	Napier	0.4378	0.5673
1899	Otaki	0.5018	0.5723
1899	Pahiatua	0.4271	0.6218
1899	Palmerston	0.3842	0.3391
1899	Parnell	0.4838	0.5155
1899	Patea	0.4781	0.4858
1899	Riccarton	0.4373	0.554
1899	Taieri	0.4891	0.6263
1899	Taranaki	0.49	0.5334
1899	Timaru	0.7511	0.7988
1899	Waiapu	0.4374	0.7243
1899	Waikato	0.5571	0.3943
1899	Waikouaiti	0.5649	0.5409
1899	Waipawa	0.4769	0.6218
1899	Wairarapa	0.5064	0.5155
1899	Wairau	0.575	0.7224
1899	Wakatipu	0.4974	0.4662
1899	Wallace	0.4634	0.566
1902	Awarua	0.6923	0.7985
1902	Bay of Islands	0.5061	0.6148

Year	Electorate	Non-Parametric Estimate of Women's Opposition Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Opposition Votes/ Total Votes Cast by Men
1896	Wakatipu	0.4549	0.5755
1896	Wanganui	0.4939	0.5188
1896	Westland	0.4094	0.1401
1899	Ashburton	0.3653	0.2442
1899	Awarua	0.2543	0.1979
1899	Bay of Islands	0.4979	0.4877
1899	Bay of Plenty	0.488	0.5637
1899	Bruce	0.4997	0.5898
1899	City of Nelson	0.425	0.4473
1899	Clutha	0.4925	0.4816
1899	Eden	0.4969	0.5028
1899	Egmont	0.4855	0.4595
1899	Ellesmere	0.4981	0.5274
1899	Franklin	0.6149	0.6892
1899	Geraldine	0.1513	0.1007
1899	Hawera	0.4572	0.409
1899	Kaiapoi	0.4198	0.4296
1899	Lyttelton	0.259	0.2371
1899	Manawatu	0.5238	0.4532
1899	Marsden	0.3384	0.1861
1899	Masterton	0.4591	0.281
1899	Mataura	0.4984	0.4705
1899	Motueka	0.4288	0.2649
1899	Napier	0.4996	0.4907
1899	Otaki	0.4827	0.4375
1899	Pahiatua	0.5216	0.4088
1899	Palmerston	0.1624	0.1509
1899	Patea	0.5016	0.5258
1899	Rangitikei	0.4476	0.5743
1899	Riccarton	0.5063	0.4945
1899	Selwyn	0.5028	0.3232
1899	Suburbs of Wellington	0.4019	0.3723
1899	Taieri	0.4432	0.4237
1899	Taranaki	0.466	0.5022
1899	Thames	0.1577	0.1496
1899	Timaru	0.2393	0.1761
1899	Tuapeka	0.5218	0.3268
1899	Waiapu	0.536	0.2595
1899	Waikato	0.5183	0.5507
1899	Waikouaiti	0.4373	0.4572
1899	Waipawa	0.4766	0.4057
1899	Wairarapa	0.4651	0.4747
1899	Wairau	0.435	0.2709
1899	Waitaki	0.3074	0.16
1899	Waitemata	0.4898	0.5261
1899	Wakatipu	0.448	0.5627
1899	Wallace	0.5214	0.4419
1899	Wanganui	0.4065	0.4337
1902	Bay of Islands	0.4653	0.4024
1902	Bay of Plenty	0.4754	0.4889

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1902	Bruce	0.3329	0.3779
1902	Buller	0.7547	0.847
1902	Caversham	0.5196	0.563
1902	Chalmers	0.5683	0.5637
1902	Eden	0.2566	0.2939
1902	Egmont	0.5799	0.4587
1902	Geraldine	0.6188	0.6492
1902	Grey	0.7	0.8757
1902	Grey Lynn	0.4649	0.5692
1902	Hawera	0.4729	0.522
1902	Hutt	0.5126	0.5715
1902	Invercargill	0.6483	0.6457
1902	Kaiapoi	0.6192	0.7011
1902	Manawatu	0.5796	0.4074
1902	Manukau	0.3941	0.5612
1902	Marsden	0.5412	0.4604
1902	Masterton	0.5048	0.6958
1902	Mataura	0.5041	0.573
1902	Motueka	0.7511	0.891
1902	Mount Ida	0.5467	0.4438
1902	Napier	0.6553	0.7149
1902	Oroua	0.3916	0.4142
1902	Otaki	0.7463	0.8384
1902	Parnell	0.5393	0.494
1902	Patea	0.5148	0.5664
1902	Taranaki	0.5024	0.5612
1902	Thames	0.5903	0.6158
1902	Timaru	0.6113	0.6567
1902	Tuapeka	0.5036	0.5122
1902	Waiapu	0.4899	0.7817
1902	Waikato	0.4587	0.4827
1902	Waipawa	0.6156	0.7819
1902	Wairarapa	0.5483	0.4552
1902	Wairau	0.5009	0.578
1902	Waitaki	0.4741	0.6654
1902	Wallace	0.5658	0.3108
1902	Wanganui	0.6092	0.569
1902	Westland	0.8832	0.9493
1905	Auckland Central	0.5575	0.5136
1905	Auckland East	0.4197	0.5027
1905	Auckland West	0.2747	0.5253
1905	Avon	0.2726	0.5545
1905	Awarua	0.7755	0.8474
1905	Bay of Islands	0.5099	0.4162
1905	Bay of Plenty	0.5103	0.4591
1905	Bruce	0.4595	0.4331
1905	Buller	0.6471	0.8249
1905	Caversham	0.6979	0.5655
1905	Chalmers	0.6364	0.5542
1905	Christchurch South	0.6189	0.5266
1905	City of Nelson	0.4498	0.5417

Year	Electorate	Non-Parametric Estimate of Women's Opposition Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Opposition Votes/ Total Votes Cast by Men
1902	Bruce	0.6597	0.6285
1902	Chalmers	0.4085	0.4593
1902	Clutha	0.4583	0.4479
1902	Courtenay	0.4585	0.5172
1902	Eden	0.7393	0.7098
1902	Ellesmere	0.5351	0.621
1902	Geraldine	0.4011	0.3355
1902	Grey Lynn	0.5017	0.4684
1902	Hawera	0.5237	0.4804
1902	Hawke's Bay	0.5771	0.8056
1902	Hurunui	0.3701	0.1769
1902	Hutt	0.4532	0.4146
1902	Kaipara	0.5071	0.2372
1902	Manukau	0.5885	0.4573
1902	Marsden	0.4748	0.5293
1902	Masterton	0.5522	0.2666
1902	Mataura	0.4706	0.4443
1902	Oamaru	0.1885	0.1506
1902	Oroua	0.6738	0.5321
1902	Pahiatua	0.5408	0.336
1902	Palmerston	0.4369	0.3875
1902	Patea	0.5041	0.4222
1902	Rangitikei	0.543	0.2305
1902	Selwyn	0.4572	0.5227
1902	Taieri	0.4117	0.3854
1902	Taranaki	0.4818	0.4515
1902	Tuapeka	0.445	0.5186
1902	Waikato	0.5098	0.5387
1902	Waipawa	0.4392	0.1865
1902	Wairarapa	0.3898	0.5852
1902	Waitemata	0.5014	0.3501
1902	Wakatipu	0.4481	0.5416
1902	Wanganui	0.2843	0.3
1905	Ashburton	0.47	0.4072
1905	Auckland Central	0.386	0.3179
1905	Auckland East	0.2748	0.3308
1905	Auckland West	0.3002	0.39
1905	Bay of Islands	0.4647	0.2445
1905	Bay of Plenty	0.4797	0.5326
1905	Bruce	0.565	0.5377
1905	Caversham	0.304	0.4051
1905	Chalmers	0.3228	0.3728
1905	Christchurch South	0.1919	0.1744
1905	City of Nelson	0.513	0.4692
1905	Clutha	0.5019	0.4917
1905	Courtenay	0.474	0.567

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1905	Clutha	0.5083	0.3711
1905	Courtenay	0.4687	0.4622
1905	Dunedin Central	0.6707	0.6104
1905	Dunedin North	0.5486	0.5168
1905	Dunedin South	0.5934	0.5308
1905	Egmont	0.42	0.5954
1905	Franklin	0.4887	0.3379
1905	Geraldine	0.5911	0.6753
1905	Grey Lynn	0.4917	0.5435
1905	Hawera	0.4699	0.3869
1905	Hawke's Bay	0.5221	0.6415
1905	Hurunui	0.4462	0.7217
1905	Hutt	0.4743	0.6495
1905	Kaiapoi	0.471	0.5213
1905	Kaipara	0.5363	0.4683
1905	Lyttelton	0.2949	0.2255
1905	Manawatu	0.4754	0.522
1905	Manukau	0.3798	0.4831
1905	Marsden	0.4994	0.4204
1905	Masterton	0.5153	0.6153
1905	Mataura	0.5004	0.5668
1905	Motueka	0.787	0.8744
1905	Mount Ida	0.4769	0.6037
1905	Newtown	0.4091	0.4471
1905	Ohinemuri	0.4862	0.5401
1905	Otaki	0.536	0.7506
1905	Pahiatua	0.4767	0.5175
1905	Palmerston	0.5003	0.553
1905	Patea	0.4798	0.4516
1905	Rangitikei	0.374	0.7549
1905	Selwyn	0.4969	0.4281
1905	Taieri	0.4216	0.4389
1905	Thames	0.6097	0.6877
1905	Timaru	0.5419	0.6246
1905	Tuapeka	0.5088	0.6793
1905	Waiapu	0.4524	0.5906
1905	Waikato	0.5262	0.4853
1905	Waipawa	0.4958	0.6694
1905	Wairarapa	0.492	0.5789
1905	Wairau	0.5559	0.6065
1905	Waitemata	0.453	0.3607
1905	Wakatipu	0.5368	0.3945
1905	Wallace	0.5119	0.4042
1905	Wellington East	0.4395	0.4194
1905	Wellington North	0.495	0.5184
1905	Westland	0.9028	0.9328

Year	Electorate	Non-Parametric Estimate of Women's Opposition Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Opposition Votes/ Total Votes Cast by Men
1905	Dunedin South	0.3911	0.4711
1905	Eden	0.7514	0.7215
1905	Egmont	0.488	0.3542
1905	Ellesmere	0.509	0.472
1905	Franklin	0.456	0.6601
1905	Geraldine	0.4119	0.3013
1905	Grey Lynn	0.4573	0.4951
1905	Hawke's Bay	0.4973	0.329
1905	Hurunui	0.3876	0.2174
1905	Invercargill	0.257	0.3026
1905	Kaiapoi	0.5099	0.4637
1905	Kaipara	0.4373	0.5291
1905	Manawatu	0.5051	0.3809
1905	Manukau	0.6366	0.484
1905	Marsden	0.5012	0.5332
1905	Masterton	0.4665	0.3769
1905	Mataura	0.4615	0.4503
1905	Mount Ida	0.5079	0.3977
1905	Newtown	0.2742	0.2623
1905	Ohinemuri	0.4848	0.4101
1905	Oroua	0.485	0.4883
1905	Otaki	0.3885	0.2779
1905	Palmerston	0.5297	0.3963
1905	Patea	0.548	0.3618
1905	Rangitikei	0.5687	0.2448
1905	Riccarton	0.231	0.2688
1905	Selwyn	0.5294	0.5371
1905	Taieri	0.5478	0.5702
1905	Taranaki	0.3209	0.3248
1905	Thames	0.3409	0.33
1905	Timaru	0.4289	0.3907
1905	Tuapeka	0.486	0.3109
1905	Waiapu	0.1773	0.0958
1905	Waikato	0.4949	0.4883
1905	Waipawa	0.4999	0.3185
1905	Wairarapa	0.4763	0.3987
1905	Wairau	0.4752	0.3444
1905	Waitemata	0.5971	0.5716
1905	Wakatipu	0.4532	0.6003
1905	Wellington East	0.4786	0.3894
1905	Wellington North	0.4715	0.4021

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1908	Ashburton	0.4062	0.3719
1908	Auckland Central	0.2923	0.2013
1908	Auckland East	0.5775	0.5321
1908	Auckland West	0.6134	0.5824
1908	Awarua	0.5467	0.7195
1908	Bay of Islands	0.4998	0.5441
1908	Bay of Plenty	0.5413	0.3766
1908	Christchurch East	0.5643	0.542
1908	Christchurch North	0.2508	0.4744
1908	Christchurch South	0.5468	0.508
1908	Dunedin West	0.7323	0.5797
1908	Eden	0.2868	0.3679
1908	Franklin	0.4224	0.3153
1908	Gisborne	0.5478	0.4392
1908	Grey Lynn	0.6157	0.4726
1908	Hutt	0.4593	0.7396
1908	Invercargill	0.5846	0.5484
1908	Kaiapoi	0.5009	0.4972
1908	Kaipara	0.4958	0.5452
1908	Masterton	0.5743	0.6321
1908	Mataura	0.5036	0.4248
1908	Motueka	0.5305	0.81
1908	Otaki	0.4977	0.5079
1908	Pahiatua	0.4807	0.3877
1908	Palmerston	0.4329	0.4677
1908	Parnell	0.5648	0.4541
1908	Patea	0.5146	0.4397
1908	Rangitikei	0.4708	0.5385
1908	Riccarton	0.6613	0.6026
1908	Selwyn	0.5526	0.3967
1908	Stratford	0.4359	0.3016
1908	Taranaki	0.1578	0.1639
1908	Taumarunui	0.3837	0.8063
1908	Tauranga	0.4751	0.2989
1908	Thames	0.5621	0.7217
1908	Timaru	0.3458	0.4115
1908	Waikato	0.5431	0.5217
1908	Waipawa	0.4952	0.5053
1908	Wairarapa	0.4689	0.4909
1908	Wairau	0.4811	0.4672
1908	Waitaki	0.5286	0.4858
1908	Wakatipu	0.5551	0.2547
1908	Wellington East	0.1771	0.1865
1911	Auckland Central	0.4486	0.5764
1911	Auckland West	0.4094	0.4267
1911	Avon	0.3123	0.4525
1911	Awarua	0.4603	0.5916

Year	Electorate	Non-Parametric Estimate of Women's Reform Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Reform Votes/ Total Votes Cast by Men
1908	Avon	0.1747	0.2122
1908	Bay of Islands	0.5132	0.4446
1908	Bay of Plenty	0.5156	0.2721
1908	Bruce	0.575	0.5675
1908	Christchurch East	0.0714	0.0766
1908	Clutha	0.8654	0.717
1908	Dunedin North	0.4004	0.4485
1908	Eden	0.7081	0.6095
1908	Ellesmere	0.4911	0.6493
1908	Franklin	0.5175	0.7008
1908	Geraldine	0.5273	0.2835
1908	Gisborne	0.2272	0.1839
1908	Grey Lynn	0.3782	0.4764
1908	Hurunui	0.4778	0.2018
1908	Kaiapoi	0.4702	0.4989
1908	Kaipara	0.5438	0.4291
1908	Manawatu	0.4957	0.4002
1908	Manukau	0.5148	0.5133
1908	Marsden	0.4501	0.5733
1908	Mataura	0.5464	0.5315
1908	Motueka	0.3865	0.2282
1908	Ohinemuri	0.2514	0.1942
1908	Oroua	0.4738	0.5142
1908	Pahiatua	0.3218	0.2587
1908	Palmerston	0.4355	0.4807
1908	Patea	0.56	0.493
1908	Riccarton	0.4037	0.3236
1908	Selwyn	0.4354	0.5929
1908	Stratford	0.5085	0.511
1908	Taranaki	0.5621	0.5079
1908	Taumarunui	0.5035	0.2241
1908	Tauranga	0.5003	0.6978
1908	Timaru	0.3575	0.3604
1908	Tuapeka	0.3917	0.2794
1908	Waikato	0.4961	0.4235
1908	Waipawa	0.4921	0.4901
1908	Wairarapa	0.4375	0.5556
1908	Wairau	0.5039	0.53
1908	Waitaki	0.4959	0.3974
1908	Waitemata	0.4931	0.4298
1908	Wakatipu	0.441	0.7337
1908	Wanganui	0.2866	0.2529
1908	Wellington Central	0.4736	0.5305
1908	Wellington North	0.4527	0.3324
1908	Wellington South	0.056	0.0619
1908	Wellington Suburbs	0.1868	0.1834
1911	Ashburton	0.4435	0.4785
1911	Auckland West	0.6062	0.5292
1911	Avon	0.1201	0.1472
1911	Awarua	0.491	0.3695

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1911	Bay of Islands	0.4117	0.5497
1911	Bay of Plenty	0.4029	0.5976
1911	Bruce	0.4268	0.4419
1911	Buller	0.4868	0.5226
1911	Chalmers	0.4231	0.4503
1911	Christchurch East	0.241	0.3571
1911	Christchurch North	0.0606	0.1078
1911	Christchurch South	0.4743	0.5112
1911	Clutha	0.4715	0.4507
1911	Dunedin Central	0.2324	0.3913
1911	Dunedin North	0.2069	0.2247
1911	Dunedin South	0.5558	0.5193
1911	Dunedin West	0.4138	0.4988
1911	Eden	0.4091	0.4775
1911	Egmont	0.4535	0.5727
1911	Ellesmere	0.1466	0.1131
1911	Franklin	0.3518	0.2987
1911	Grey	0.5141	0.6361
1911	Grey Lynn	0.4294	0.4102
1911	Hurunui	0.4563	0.6717
1911	Hutt	0.5088	0.4978
1911	Invercargill	0.3778	0.4391
1911	Kaiapoi	0.3442	0.3627
1911	Kaipara	0.5076	0.3896
1911	Lyttelton	0.7409	0.5845
1911	Marsden	0.4967	0.4129
1911	Motueka	0.3873	0.763
1911	Napier	0.5162	0.61
1911	Nelson	0.1253	0.1267
1911	Ohinemuri	0.4303	0.4555
1911	Oroua	0.4127	0.3722
1911	Otaki	0.4268	0.2417
1911	Pahiatua	0.4034	0.3598
1911	Palmerston	0.3687	0.3771
1911	Parnell	0.2757	0.4224
1911	Rangitikei	0.4138	0.3434
1911	Riccarton	0.4249	0.4428
1911	Selwyn	0.4402	0.5784
1911	Stratford	0.4524	0.4616
1911	Taranaki	0.4239	0.391
1911	Taumarunui	0.4023	0.5248
1911	Tauranga	0.4637	0.2239
1911	Temuka	0.5365	0.5409
1911	Thames	0.4731	0.4883
1911	Waikato	0.367	0.4374
1911	Waipawa	0.4194	0.4683
1911	Wairarapa	0.4643	0.4807
1911	Wairau	0.4641	0.2978
1911	Waitaki	0.3741	0.2628
1911	Waitemata	0.4186	0.3898
1911	Wakatipu	0.4477	0.4868

Year	Electorate	Non-Parametric Estimate of Women's Reform Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Reform Votes/ Total Votes Cast by Men
1911	Bay of Islands	0.5165	0.4622
1911	Bay of Plenty	0.4367	0.4542
1911	Bruce	0.4878	0.6095
1911	Buller	0.4892	0.4825
1911	Chalmers	0.2529	0.2003
1911	Christchurch North	0.3203	0.5141
1911	Clutha	0.43	0.6064
1911	Dunedin Central	0.5139	0.4871
1911	Dunedin North	0.4155	0.5241
1911	Dunedin West	0.3752	0.4637
1911	Eden	0.5499	0.5363
1911	Egmont	0.5028	0.4397
1911	Ellesmere	0.5151	0.6229
1911	Franklin	0.6176	0.711
1911	Grey Lynn	0.2027	0.2197
1911	Hawke's Bay	0.486	0.3181
1911	Hurunui	0.5003	0.3391
1911	Hutt	0.1183	0.1367
1911	Invercargill	0.3229	0.2308
1911	Kaiapoi	0.3737	0.3649
1911	Kaipara	0.2108	0.1304
1911	Manukau	0.5259	0.5817
1911	Marsden	0.5007	0.5687
1911	Masterton	0.3505	0.367
1911	Mataura	0.4493	0.6553
1911	Motueka	0.505	0.2907
1911	Nelson	0.4256	0.4788
1911	Oamaru	0.4604	0.5364
1911	Ohinemuri	0.313	0.1998
1911	Oroua	0.4761	0.6866
1911	Otago Central	0.4595	0.6725
1911	Otaki	0.2186	0.2027
1911	Pahiatua	0.4723	0.3687
1911	Palmerston	0.4768	0.5124
1911	Parnell	0.4129	0.4215
1911	Patea	0.5236	0.5314
1911	Raglan	0.4885	0.4043
1911	Rangitikei	0.5023	0.6035
1911	Riccarton	0.3082	0.2763
1911	Selwyn	0.5166	0.4379
1911	Stratford	0.4708	0.5751
1911	Taranaki	0.5332	0.5211
1911	Taumarunui	0.4984	0.5139
1911	Tauranga	0.5061	0.7614
1911	Temuka	0.1839	0.1577
1911	Timaru	0.2632	0.2549
1911	Waimarino	0.553	0.3249
1911	Waipawa	0.5011	0.5666
1911	Wairarapa	0.5008	0.491
1911	Wairau	0.4309	0.3936
1911	Waitaki	0.418	0.3277

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1911	Wallace	0.4081	0.7461
1911	Wanganui	0.2592	0.3154
1911	Wellington Central	0.3993	0.3495
1911	Wellington East	0.1537	0.1543
1911	Wellington North	0.2744	0.3294
1911	Wellington South	0.1726	0.1673
1911	and Country Districts	0.2008	0.1951
1911	Westland	0.421	0.5766
1914	Ashburton	0.5066	0.4641
1914	Auckland Central	0.4562	0.6375
1914	Auckland East	0.7458	0.5656
1914	Auckland West	0.6168	0.5417
1914	Avon	0.377	0.4836
1914	Awarua	0.4771	0.7171
1914	Bay of Islands	0.6044	0.2331
1914	Bay of Plenty	0.4429	0.6109
1914	Bruce	0.4813	0.3931
1914	Buller	0.4127	0.8068
1914	Christchurch East	0.5694	0.488
1914	Christchurch North	0.6215	0.4836
1914	Christchurch South	0.6004	0.5135
1914	Clutha	0.521	0.3146
1914	Dunedin South	0.7192	0.5936
1914	Dunedin West	0.4423	0.4961
1914	Egmont	0.4798	0.5195
1914	Ellesmere	0.4932	0.4517
1914	Franklin	0.2737	0.2831
1914	Gisborne	0.4843	0.6286
1914	Hawke's Bay	0.5618	0.4491
1914	Hurunui	0.4378	0.7656
1914	Hutt	0.5541	0.5576
1914	Invercargill	0.6039	0.5946
1914	Kaiapoi	0.5679	0.62
1914	Kaipara	0.5187	0.3286
1914	Manukau	0.4323	0.426
1914	Marsden	0.4621	0.3841
1914	Masterton	0.4862	0.4791
1914	Mataura	0.4909	0.4766
1914	Motueka	0.5395	0.3649
1914	Napier	0.6578	0.6339
1914	Nelson	0.4609	0.5147
1914	Oamaru	0.4737	0.4608
1914	Ohinemuri	0.5135	0.4969
1914	Oroua	0.4636	0.338
1914	Otago Central	0.5448	0.3354
1914	Pahiatua	0.5844	0.3253
1914	Palmerston	0.2236	0.2015
1914	Patea	0.5259	0.4558
1914	Raglan	0.5671	0.2547

Year	Electorate	Non-Parametric Estimate of Women's Reform Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Reform Votes/ Total Votes Cast by Men
1911	Waitemata	0.3341	0.399
1911	Wakatipu	0.5596	0.5013
1911	Wallace	0.3392	0.1706
1911	Wanganui	0.2299	0.2087
1911	Wellington Central	0.402	0.3472
1911	Wellington East	0.3579	0.4798
1911	Wellington North	0.5503	0.5118
1911	Wellington South	0.3961	0.402
1911	Wellington Suburbs	0.3616	0.4118
1914	Ashburton	0.4739	0.5335
1914	Auckland Central	0.2188	0.1551
1914	Auckland East	0.2769	0.3803
1914	Auckland West	0.3796	0.4416
1914	Avon	0.2283	0.3066
1914	Awarua	0.441	0.3303
1914	Bay of Plenty	0.5654	0.3671
1914	Bruce	0.5129	0.5936
1914	Buller	0.3831	0.1829
1914	Chalmers	0.3885	0.6031
1914	Christchurch East	0.1653	0.1853
1914	Christchurch North	0.3277	0.5548
1914	Christchurch South	0.1664	0.1496
1914	Clutha	0.4368	0.7039
1914	Dunedin Central	0.4484	0.5282
1914	Dunedin North	0.4465	0.5058
1914	Dunedin South	0.2886	0.3729
1914	Dunedin West	0.5039	0.5194
1914	Eden	0.5317	0.5382
1914	Egmont	0.4148	0.6742
1914	Ellesmere	0.5238	0.5152
1914	Franklin	0.684	0.7319
1914	Gisborne	0.4781	0.374
1914	Grey	0.4776	0.3791
1914	Grey Lynn	0.2872	0.3639
1914	Hawke's Bay	0.4792	0.5011
1914	Hurunui	0.5028	0.2555
1914	Hutt	0.4778	0.3782
1914	Invercargill	0.4372	0.3537
1914	Kaiapoi	0.377	0.4213
1914	Kaipara	0.4846	0.6449
1914	Lyttelton	0.3791	0.3789
1914	Manukau	0.5125	0.6005
1914	Marsden	0.4917	0.6406
1914	Masterton	0.444	0.5586
1914	Mataura	0.5158	0.5113
1914	Motueka	0.4645	0.6255
1914	Napier	0.3356	0.3513
1914	Nelson	0.4339	0.567
1914	Oamaru	0.4476	0.5836
1914	Ohinemuri	0.5382	0.449

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1914	Rangitikei	0.5285	0.3304
1914	Riccarton	0.6511	0.5012
1914	Selwyn	0.5222	0.5139
1914	Stratford	0.5034	0.3826
1914	Taranaki	0.4264	0.3743
1914	Taumarunui	0.4885	0.5159
1914	Tauranga	0.4709	0.2633
1914	Temuka	0.4708	0.583
1914	Thames	0.5181	0.4018
1914	Timaru	0.6216	0.5054
1914	Waikato	0.4563	0.2883
1914	Waimarino	0.3651	0.8024
1914	Waipawa	0.5018	0.4673
1914	Wairarapa	0.4801	0.5167
1914	Wairau	0.5613	0.4762
1914	Waitaki	0.4485	0.5522
1914	Waitemata	0.4901	0.3923
1914	Wakatipu	0.5538	0.3053
1914	Wallace	0.5302	0.6094
1914	Wellington Central	0.6029	0.6642
1914	Wellington North	0.1956	0.2638
1914	Wellington South	0.5868	0.5359
1914	Westland	0.4915	0.6175
1919	Ashburton	0.4257	0.3241
1919	Auckland Central	0.4302	0.3448
1919	Auckland East	0.3782	0.4329
1919	Avon	0.3679	0.4058
1919	Awarua	0.0796	0.0661
1919	Bay of Plenty	0.4064	0.7
1919	Bruce	0.4836	0.4825
1919	Buller	0.3898	0.433
1919	Chalmers	0.241	0.2236
1919	Christchurch East	0.6426	0.5381
1919	Christchurch North	0.7406	0.4321
1919	Dunedin South	0.573	0.401
1919	Eden	0.239	0.2163
1919	Egmont	0.4251	0.5233
1919	Ellesmere	0.4565	0.4186
1919	Franklin	0.2294	0.1596
1919	Gisborne	0.3574	0.3038
1919	Hurunui	0.4784	0.5512
1919	Hutt	0.4349	0.3982

Year	Electorate	Non-Parametric Estimate of Women's Reform Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Reform Votes/ Total Votes Cast by Men
1914	Oroua	0.4805	0.6878
1914	Otago Central	0.4447	0.658
1914	Otaki	0.4474	0.6195
1914	Pahiatua	0.4141	0.6623
1914	Parnell	0.5776	0.5245
1914	Patea	0.5209	0.4912
1914	Raglan	0.429	0.7031
1914	Rangitikei	0.4641	0.6629
1914	Riccarton	0.4167	0.4133
1914	Stratford	0.4805	0.61
1914	Taranaki	0.586	0.5879
1914	Taumarunui	0.5508	0.4476
1914	Tauranga	0.4782	0.7465
1914	Temuka	0.4948	0.4383
1914	Thames	0.4846	0.5789
1914	Timaru	0.3693	0.4794
1914	Waikato	0.5213	0.7071
1914	Waimarino	0.5195	0.2427
1914	Waipawa	0.5127	0.4958
1914	Wairarapa	0.4564	0.516
1914	Wairau	0.4559	0.4695
1914	Waitaki	0.4511	0.5083
1914	Waitemata	0.4879	0.606
1914	Wakatipu	0.4262	0.6958
1914	Wallace	0.4813	0.3672
1914	Wanganui	0.2767	0.3438
1914	Wellington Central	0.4014	0.3126
1914	Wellington East	0.5008	0.4971
1914	Wellington North	0.5474	0.5565
1914	Wellington Suburbs	0.5099	0.4945
1914	Westland	0.5332	0.354
1919	Ashburton	0.5387	0.6199
1919	Auckland Central	0.1296	0.1152
1919	Auckland East	0.3441	0.4337
1919	Auckland West	0.3139	0.46
1919	Avon	0.0228	0.0253
1919	Awarua	0.5218	0.5899
1919	Bay of Islands	0.5238	0.684
1919	Bay of Plenty	0.5568	0.3025
1919	Bruce	0.5479	0.4674
1919	Chalmers	0.4332	0.4695
1919	Clutha	0.4919	0.3176
1919	Dunedin Central	0.5664	0.4747
1919	Eden	0.486	0.5503
1919	Egmont	0.5784	0.4596
1919	Ellesmere	0.6041	0.5029
1919	Franklin	0.5446	0.7918
1919	Grey Lynn	0.2724	0.3408
1919	Hawke's Bay	0.4504	0.3868
1919	Hutt	0.2722	0.2913

Year	Electorate	Non-Parametric Estimate of Women's Liberal Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Liberal Votes/ Total Votes Cast by Men
1919	Invercargill	0.6568	0.4994
1919	Kaiapoi	0.3904	0.3647
1919	Marsden	0.3686	0.3426
1919	Masterton	0.4072	0.2906
1919	Mataura	0.0291	0.0327
1919	Motueka	0.2869	0.1845
1919	Napier	0.331	0.3429
1919	Nelson	0.4773	0.4335
1919	Oamaru	0.4998	0.4568
1919	Ohinemuri	0.4779	0.5931
1919	Otaki	0.0377	0.0383
1919	Pahiatua	0.4654	0.3392
1919	Patea	0.4222	0.4331
1919	Rangitikei	0.3228	0.1871
1919	Riccarton	0.4209	0.3827
1919	Roskill	0.0674	0.091
1919	Rotorua	0.2813	0.203
1919	Tauranga	0.4115	0.2838
1919	Temuka	0.5273	0.4664
1919	Thames	0.3054	0.2245
1919	Timaru	0.6699	0.4887
1919	Waikato	0.0951	0.1029
1919	Waimarino	0.4479	0.6057
1919	Waipawa	0.4558	0.4878
1919	Wairau	0.4099	0.3022
1919	Waitaki	0.3851	0.2775
1919	Waitemata	0.3821	0.4412
1919	Waitomo	0.4499	0.5151
1919	Wakatipu	0.4314	0.5319
1919	Wallace	0.4417	0.5243
1919	Wellington Central	0.3904	0.452
1919	Wellington East	0.2096	0.2703
1919	Wellington North	0.3363	0.2901
1919	Wellington Suburbs	0.2368	0.2138
1919	Westland	0.5438	0.6466

Year	Electorate	Non-Parametric Estimate of Women's Reform Votes/ Total Votes Cast by Women	Non-Parametric Estimate of Men's Reform Votes/ Total Votes Cast by Men
1919	Kaiapoi	0.3477	0.4193
1919	Kaipara	0.6871	0.8544
1919	Lyttelton	0.3162	0.3357
1919	Manawatu	0.4817	0.6471
1919	Manukau	0.6038	0.4778
1919	Marsden	0.4666	0.3214
1919	Masterton	0.1099	0.1119
1919	Mataura	0.494	0.5367
1919	Motueka	0.5336	0.3796
1919	Nelson	0.352	0.4261
1919	Oamaru	0.4892	0.54
1919	Ohinemuri	0.5273	0.3869
1919	Oroua	0.5833	0.6768
1919	Otaki	0.5612	0.5347
1919	Pahiatua	0.4883	0.3678
1919	Palmerston	0.5746	0.5229
1919	Parnell	0.7288	0.5031
1919	Patea	0.552	0.3866
1919	Raglan	0.4732	0.5452
1919	Rangitikei	0.4952	0.3736
1919	Riccarton	0.294	0.3405
1919	Rotorua	0.5076	0.4921
1919	Stratford	0.4441	0.5219
1919	Taranaki	0.3757	0.4777
1919	Tauranga	0.527	0.7294
1919	Temuka	0.485	0.5088
1919	Thames	0.4582	0.5987
1919	Waikato	0.6801	0.5801
1919	Waipawa	0.4903	0.5336
1919	Wairarapa	0.478	0.5487
1919	Wairau	0.2135	0.1779
1919	Waitaki	0.3506	0.4458
1919	Waitemata	0.6336	0.5116
1919	Waitomo	0.493	0.3857
1919	Wakatipu	0.4417	0.305
1919	Wallace	0.476	0.5145
1919	Wanganui	0.2638	0.3717
1919	Wellington East	0.395	0.4632
1919	Wellington North	0.4354	0.4188
1919	Wellington Suburbs	0.4199	0.465

Appendix 3

Non-Parametric Electorate Estimates of Women's and Men's Votes at Local Licensing Polls, 1896-1914

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1896	Ashburton	0.4883	0.5551	0.4358	0.2644	0.4247	0.373
1896	Ashley	0.497	0.6182	0.3826	0.2142	0.4557	0.2887
1896	Avon	0.59	0.5881	0.3322	0.3097	0.327	0.3085
1896	Awarua	0.4801	0.6184	0.442	0.2563	0.516	0.2961
1896	Bay of Islands	0.4982	0.5958	0.54	0.2265	0.4813	0.2837
1896	Bay of Plenty	0.4994	0.5784	0.4997	0.2612	0.4423	0.3166
1896	Bruce	0.4861	0.4385	0.5091	0.4311	0.489	0.5076
1896	Buller	0.4842	0.5475	0.4607	0.2338	0.4817	0.2628
1896	Caversham	0.6802	0.5442	0.37	0.3235	0.2284	0.341
1896	City of Auckland	0.3522	0.6019	0.4545	0.3644	0.3688	0.3653
1896	City of Christchurch	0.4818	0.6024	0.4946	0.3027	0.3021	0.3897
1896	City of Dunedin	0.4978	0.5882	0.3411	0.3839	0.2567	0.3575
1896	City of Nelson	0.5476	0.588	0.3714	0.3367	0.2675	0.2798
1896	City of Wellington	0.4993	0.5327	0.5476	0.3376	0.452	0.3163
1896	Clutha	0.5794	0.3422	0.483	0.4079	0.52	0.5428
1896	Eden	0.4005	0.6157	0.4719	0.3367	0.4774	0.3432
1896	Egmont	0.5643	0.4179	0.4779	0.3245	0.4802	0.4495
1896	Ellesmere	0.4769	0.6181	0.4463	0.2994	0.464	0.3423
1896	Franklin	0.5007	0.5283	0.4677	0.4224	0.4748	0.3887
1896	Geraldine	0.5206	0.558	0.293	0.3193	0.4897	0.3294
1896	Grey	0.4256	0.6998	0.4607	0.254	0.5335	0.2221
1896	Hawera	0.5455	0.339	0.4671	0.4368	0.4931	0.5481
1896	Hawke's Bay	0.5131	0.5842	0.4321	0.2421	0.4614	0.3532
1896	Invercargill	0.5913	0.5352	0.4661	0.3151	0.3611	0.4403
1896	Kaiapoi	0.4732	0.5523	0.4789	0.3608	0.4564	0.4372
1896	Lyttelton	0.5725	0.5753	0.3032	0.2973	0.286	0.3507
1896	Manawatu	0.4616	0.6171	0.4077	0.2665	0.5008	0.3051
1896	Manukau	0.4939	0.5841	0.4812	0.318	0.3742	0.3681
1896	Marsden	0.614	0.3038	0.4383	0.43	0.3883	0.5878
1896	Masterton	0.539	0.5145	0.4816	0.288	0.4237	0.4119
1896	Mataura	0.5117	0.567	0.456	0.3032	0.446	0.4045
1896	Motueka	0.4897	0.6048	0.3763	0.2007	0.3496	0.2455
1896	Oamaru	0.5219	0.5802	0.4997	0.3387	0.4366	0.3956
1896	Ohinemuri	0.5246	0.5412	0.5219	0.2212	0.4217	0.3914
1896	Otaki	0.5056	0.6042	0.2731	0.2122	0.2346	0.1744
1896	Pahiatua	0.5397	0.3931	0.4974	0.2646	0.4319	0.5219
1896	Palmerston	0.4612	0.597	0.5081	0.3159	0.482	0.3459
1896	Parnell	0.4682	0.5504	0.4742	0.3367	0.3554	0.3627
1896	Patea	0.5893	0.4215	0.4462	0.3562	0.437	0.4654
1896	Rangitikei	0.4589	0.6091	0.4757	0.2703	0.4399	0.3651
1896	Riccarton	0.6819	0.5979	0.3317	0.2718	0.2866	0.2855
1896	Selwyn	0.4349	0.6549	0.5178	0.2518	0.5256	0.2786
1896	Suburbs of Wellington	0.386	0.5637	0.4179	0.3803	0.4261	0.356
1896	Taieri	0.5254	0.5656	0.5022	0.3022	0.4652	0.3405

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1896	Taranaki	0.4649	0.4966	0.5217	0.3491	0.5135	0.4339
1896	Thames	0.5442	0.4876	0.4904	0.3328	0.4337	0.4505
1896	Timaru	0.5504	0.5592	0.4771	0.3541	0.4757	0.3707
1896	Tuapeka	0.4864	0.6487	0.4215	0.2305	0.4649	0.258
1896	Waiapu	0.528	0.4544	0.4658	0.3701	0.4835	0.4763
1896	Waihemo	0.4598	0.6244	0.4668	0.2546	0.502	0.3168
1896	Waikato	0.436	0.6848	0.4662	0.2561	0.4075	0.3156
1896	Waikouaiti	0.4915	0.5565	0.4386	0.3367	0.4906	0.3466
1896	Waipawa	0.4692	0.587	0.4011	0.2294	0.4498	0.3514
1896	Wairarapa	0.4647	0.6723	0.4242	0.2088	0.3695	0.2932
1896	Wairau	0.563	0.6569	0.3451	0.2354	0.3132	0.2433
1896	Waitaki	0.4751	0.523	0.5153	0.2988	0.4577	0.4758
1896	Waitemata	0.5184	0.5353	0.5146	0.2828	0.4803	0.3493
1896	Wakatipu	0.4832	0.6844	0.417	0.1659	0.5181	0.1939
1896	Wallace	0.4178	0.7128	0.4075	0.1661	0.4384	0.2649
1896	Wanganui	0.5178	0.5762	0.4162	0.3446	0.4715	0.3676
1896	Westland	0.4406	0.7121	0.4411	0.1777	0.4515	0.1859
1899	Ashburton	0.4983	0.415	0.4685	0.3667	0.4255	0.5091
1899	Ashley	0.4705	0.5874	0.4512	0.2347	0.5304	0.3358
1899	Avon	0.5389	0.5469	0.426	0.3225	0.3967	0.3934
1899	Awarua	0.4593	0.5455	0.4787	0.3636	0.4983	0.4332
1899	Bay of Islands	0.3427	0.7328	0.4574	0.1546	0.5511	0.185
1899	Bay of Plenty	0.5052	0.6212	0.3398	0.2305	0.3912	0.3234
1899	Buller	0.5196	0.5539	0.5075	0.2503	0.5322	0.2835
1899	Caversham	0.4521	0.5561	0.4833	0.3625	0.4314	0.4186
1899	City of Auckland	0.4318	0.5715	0.5799	0.3453	0.4102	0.4442
1899	City of Christchurch	0.6166	0.5178	0.4571	0.3573	0.3978	0.4389
1899	City of Dunedin	0.3438	0.5382	0.5598	0.3322	0.4074	0.4626
1899	City of Nelson	0.6141	0.5346	0.3918	0.3434	0.2236	0.3769
1899	City of Wellington	0.4905	0.4841	0.4826	0.3567	0.4146	0.3841
1899	Clutha	0.5143	0.2739	0.4048	0.5696	0.4426	0.6698
1899	Eden	0.4884	0.5102	0.5367	0.3643	0.4453	0.3996
1899	Egmont	0.5253	0.4846	0.4421	0.363	0.4484	0.4672
1899	Ellesmere	0.4386	0.5715	0.4189	0.3356	0.5249	0.3755
1899	Franklin	0.4444	0.4402	0.5078	0.3354	0.4609	0.4161
1899	Geraldine	0.4389	0.5708	0.3613	0.2637	0.4251	0.3955
1899	Grey	0.3884	0.7371	0.4203	0.2371	0.4517	0.2358
1899	Hawera	0.5112	0.4596	0.4949	0.3064	0.4211	0.4755
1899	Hawke's Bay	0.1348	0.117			0.8176	0.8386
1899	Invercargill	0.395	0.564	0.5836	0.3538	0.6114	0.382
1899	Kaiapoi	0.3849	0.4527	0.5618	0.4043	0.5898	0.5131
1899	Lyttelton	0.558	0.558	0.3869	0.3285	0.454	0.348
1899	Manawatu	0.4728	0.501	0.5116	0.2491	0.4789	0.397
1899	Manukau	0.4564	0.5312	0.5426	0.3392	0.3693	0.3877
1899	Marsden	0.4099	0.6221	0.469	0.2554	0.4643	0.3787
1899	Masterton	0.4737	0.4808	0.5267	0.3702	0.4577	0.5541
1899	Mataura	0.5492	0.3401	0.5062	0.4031	0.4585	0.5704
1899	Motueka	0.4848	0.7517	0.3301	0.1635	0.4241	0.2059
1899	Oamaru	0.4612	0.446	0.5648	0.4186	0.5247	0.49
1899	Ohinemuri	0.5825	0.3178	0.4597	0.3485	0.3557	0.6578

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1899	Otaki	0.4613	0.6305	0.3844	0.2124	0.3919	0.2305
1899	Pahiatua	0.5337	0.4845	0.5034	0.2479	0.4765	0.4372
1899	Palmerston	0.5269	0.5271	0.3511	0.3062	0.4558	0.3381
1899	Parnell	0.4906	0.5497	0.455	0.3739	0.339	0.418
1899	Patea	0.4844	0.5608	0.4234	0.2309	0.5363	0.3283
1899	Rangitikei	0.5525	0.484	0.521	0.1617	0.4436	0.4221
1899	Riccarton	0.5108	0.5373	0.3824	0.3165	0.3799	0.3391
1899	Selwyn	0.4922	0.4951	0.4449	0.3252	0.4956	0.3908
1899	Suburbs of Wellington	0.2561	0.3734	0.3062	0.302	0.3377	0.3537
1899	Taieri	0.4655	0.4646	0.554	0.3781	0.5589	0.397
1899	Taranaki	0.543	0.5575	0.4153	0.3077	0.4127	0.377
1899	Thames	0.5014	0.4182	0.4966	0.3874	0.4797	0.5146
1899	Timaru	0.4341	0.552	0.518	0.4276	0.5432	0.4303
1899	Tuapeka	0.4723	0.587	0.5437	0.2339	0.4673	0.3624
1899	Waiapu	0.4884	0.4768	0.5091	0.3189	0.4563	0.54
1899	Waihemo	0.0897	0.0788	0.7836	0.8073	0.8681	0.8947
1899	Waikato	0.566	0.6663	0.3124	0.2598	0.3951	0.2825
1899	Waikouaiti	0.4154	0.4966	0.5205	0.3128	0.5087	0.4404
1899	Waipawa	0.4821	0.5378	0.4894	0.232	0.4611	0.3939
1899	Wairarapa	0.5252	0.5103	0.425	0.2673	0.4709	0.3507
1899	Wairau	0.5022	0.6697	0.3642	0.2531	0.4143	0.2561
1899	Waitaki	0.4402	0.5894	0.5427	0.2519	0.4129	0.4738
1899	Waitemata	0.4589	0.6606	0.4684	0.2178	0.4927	0.2822
1899	Wakatipu	0.4453	0.6381	0.4637	0.1927	0.453	0.2613
1899	Wallace	0.4127	0.6575	0.4948	0.2037	0.5115	0.2892
1899	Wanganui	0.4762	0.5901	0.3343	0.3299	0.3767	0.4484
1899	Westland	0.4191	0.7728	0.3416	0.1726	0.4082	0.1898
1902	Ashburton	0.4236	0.3253	0.4924	0.5498	0.4818	0.6938
1902	Avon	0.3804	0.5063	0.5514	0.3916	0.5568	0.4626
1902	Awarua	0.5198	0.3084	0.524	0.4689	0.5192	0.6324
1902	Bay of Islands	0.4686	0.7221	0.2715	0.1603	0.4465	0.2169
1902	Bay of Plenty	0.4497	0.4831	0.4181	0.1829	0.5284	0.3538
1902	Bruce	0.3918	0.3847	0.5981	0.5063	0.6082	0.6004
1902	Buller	0.3664	0.7007	0.4136	0.2008	0.5242	0.3058
1902	Caversham	0.3906	0.4766	0.6503	0.3799	0.598	0.4621
1902	Chalmers	0.3122	0.4054	0.6546	0.4901	0.698	0.4908
1902	City of Auckland	0.5042	0.4709	0.4964	0.397	0.4611	0.4079
1902	City of Christchurch	0.4294	0.5091	0.5204	0.3686	0.4797	0.4581
1902	City of Dunedin	0.3404	0.5004	0.6519	0.3676	0.4911	0.4867
1902	City of Nelson	0.6386	0.5244	0.373	0.3328	0.2877	0.3228
1902	City of Wellington	0.4483	0.3998	0.5866	0.3493	0.5166	0.4288
1902	Courtenay	0.4868	0.368	0.5408	0.4343	0.4913	0.5433
1902	Eden	0.4755	0.4745	0.5847	0.3406	0.4408	0.4451
1902	Egmont	0.4469	0.5606	0.3715	0.1685	0.5564	0.3007
1902	Ellesmere	0.4475	0.5413	0.4244	0.3686	0.4868	0.4234
1902	Franklin	0.444	0.472	0.5202	0.4245	0.5207	0.4965
1902	Geraldine	0.4763	0.4528	0.5122	0.3758	0.5655	0.4392
1902	Grey	0.419	0.5496	0.4758	0.3695	0.5436	0.3911
1902	Grey Lynn	0.3772	0.5127	0.6758	0.3641	0.6035	0.4347
1902	Hawera	0.4592	0.4757	0.4504	0.3114	0.4525	0.4888

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1902	Hawke's Bay	0.4584	0.5262	0.533	0.2562	0.4996	0.3991
1902	Hurunui	0.4516	0.526	0.5511	0.2982	0.4962	0.4331
1902	Hutt	0.4074	0.4431	0.4541	0.363	0.5343	0.4537
1902	Invercargill	0.3855	0.3982	0.648	0.45	0.6484	0.5339
1902	Kaiapoi	0.4393	0.3696	0.5433	0.5278	0.6049	0.5621
1902	Kaipara	0.3841	0.6708	0.4668	0.1927	0.5413	0.2881
1902	Lyttelton	0.4294	0.4749	0.5393	0.424	0.5204	0.4995
1902	Manawatu	0.4366	0.5196	0.458	0.2625	0.5199	0.3763
1902	Manukau	0.4852	0.4993	0.4714	0.3776	0.3976	0.4397
1902	Marsden	0.4378	0.4562	0.5066	0.3989	0.5057	0.5374
1902	Masterton	0.49	0.4834	0.4819	0.2615	0.4962	0.4644
1902	Mataura	0.4598	0.3236	0.4901	0.4629	0.5246	0.64
1902	Motueka	0.3644	0.7885	0.377	0.1406	0.5453	0.1698
1902	Mount Ida	0.4542	0.4879	0.5775	0.2928	0.5014	0.4499
1902	Napier	0.4086	0.4507	0.5463	0.4818	0.5231	0.4684
1902	Newtown	0.3329	0.3944	0.6367	0.4572	0.5738	0.5953
1902	Oamaru	0.3988	0.4176	0.5589	0.4242	0.5585	0.5576
1902	Ohinemuri	0.4542	0.5279	0.5439	0.202	0.4883	0.4509
1902	Oroua	0.4453	0.5158	0.3948	0.2822	0.5008	0.4337
1902	Otaki	0.4143	0.5923	0.4579	0.3143	0.5341	0.3323
1902	Pahiatua	0.4329	0.4605	0.4529	0.2026	0.4635	0.5322
1902	Palmerston	0.4626	0.5412	0.3684	0.2757	0.4962	0.3666
1902	Parnell	0.5329	0.5117	0.3905	0.3875	0.3009	0.4217
1902	Patea	0.4686	0.4404	0.5473	0.2776	0.5024	0.4425
1902	Rangitikei	0.405	0.5751	0.382	0.1146	0.6265	0.2624
1902	Riccarton	0.5162	0.4709	0.3517	0.4515	0.2952	0.5707
1902	Selwyn	0.5307	0.3016	0.4757	0.5083	0.4428	0.6261
1902	Taieri	0.4332	0.4185	0.4788	0.4308	0.5102	0.5475
1902	Taranaki	0.4946	0.5278	0.359	0.3194	0.5265	0.3725
1902	Thames	0.4823	0.4612	0.5024	0.3431	0.5313	0.4598
1902	Timaru	0.4605	0.4265	0.5818	0.4185	0.5374	0.5348
1902	Tuapeka	0.5316	0.3867	0.5206	0.3996	0.4861	0.5067
1902	Waiapu	0.4784	0.4508	0.508	0.3305	0.4597	0.5489
1902	Waikato	0.5046	0.6414	0.421	0.258	0.4723	0.3021
1902	Waikouaiti	0.5235	0.3451	0.5735	0.4285	0.4942	0.587
1902	Waipawa	0.5103	0.4972	0.4808	0.2666	0.5408	0.407
1902	Wairarapa	0.4454	0.5274	0.3768	0.2598	0.4615	0.3995
1902	Wairau	0.4687	0.5561	0.4763	0.3119	0.5238	0.3553
1902	Waitaki	0.4906	0.3828	0.5111	0.4635	0.4818	0.5923
1902	Waitemata	0.503	0.5612	0.5001	0.3133	0.426	0.3746
1902	Wakatipu	0.4745	0.558	0.5076	0.2508	0.5097	0.3666
1902	Wallace	0.4397	0.4484	0.5423	0.3372	0.48	0.5586
1902	Wanganui	0.4677	0.5008	0.4648	0.3114	0.4904	0.43
1902	Westland	0.4349	0.79	0.4242	0.1631	0.4922	0.1508
1905	Avon	0.4484	0.5129	0.4084	0.3872	0.4634	0.5013
1905	Awarua	0.4802	0.3674	0.4635	0.5024	0.5053	0.6138
1905	Bay of Islands	0.3914	0.6114	0.361	0.192	0.5633	0.3124
1905	Bay of Plenty	0.5067	0.4188	0.4654	0.306	0.5006	0.511
1905	Bruce	0.3799	0.3983	0.5235	0.4496	0.5979	0.5744
1905	Buller	0.3753	0.5869	0.5492	0.2767	0.5703	0.3942

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1905	Caversham	0.5217	0.436	0.504	0.3777	0.4102	0.5382
1905	Chalmers	0.362	0.493	0.5695	0.386	0.5909	0.4978
1905	City of Nelson	0.5241	0.4861	0.4646	0.3699	0.3839	0.4695
1905	Courtenay	0.5231	0.3949	0.4814	0.3333	0.5272	0.4812
1905	Eden	0.384	0.4408	0.6409	0.4023	0.5526	0.5084
1905	Egmont	0.4405	0.4874	0.4489	0.169	0.5222	0.4696
1905	Ellesmere	0.5553	0.465	0.4417	0.3031	0.5094	0.433
1905	Franklin	0.4677	0.4784	0.5623	0.3147	0.4747	0.5311
1905	Geraldine	0.4541	0.5523	0.4784	0.2896	0.4917	0.436
1905	Grey	0.4217	0.5918	0.4671	0.2343	0.5239	0.3658
1905	Grey Lynn	0.2379	0.4684	0.7336	0.4253	0.7515	0.452
1905	Hawera	0.4662	0.3536	0.4786	0.2803	0.4924	0.5768
1905	Hawke's Bay	0.4774	0.4468	0.4479	0.3235	0.5039	0.5074
1905	Hurunui	0.4356	0.5867	0.4403	0.1812	0.5112	0.373
1905	Hutt	0.4892	0.3742	0.4416	0.3121	0.5613	0.5382
1905	Invercargill	0.3562	0.4272	0.6657	0.3766	0.6607	0.5303
1905	Kaiapoi	0.3723	0.4452	0.5816	0.4025	0.5497	0.5755
1905	Kaipara	0.5276	0.4674	0.4879	0.2956	0.5223	0.433
1905	Lyttelton	0.5141	0.5365	0.3624	0.3484	0.391	0.491
1905	Manawatu	0.4993	0.3767	0.484	0.2462	0.5088	0.5564
1905	Manukau	0.4141	0.4445	0.5908	0.4191	0.4894	0.5613
1905	Marsden	0.4439	0.41	0.5079	0.3412	0.4532	0.5841
1905	Masterton	0.4877	0.3441	0.4733	0.3003	0.44	0.6561
1905	Motueka	0.4217	0.6399	0.3118	0.1519	0.6077	0.2194
1905	Mount Ida	0.4576	0.4966	0.5443	0.2581	0.4493	0.518
1905	Napier	0.6252	0.5133	0.3856	0.3032	0.3618	0.3868
1905	Newtown	0.4287	0.391	0.5461	0.4006	0.5473	0.5544
1905	Oamaru	0.3445	0.353	0.5626	0.4996	0.6239	0.581
1905	Ohinemuri	0.4119	0.5365	0.4458	0.2452	0.5302	0.4389
1905	Oroua	0.5412	0.3167	0.4727	0.2326	0.483	0.6205
1905	Otaki	0.4354	0.4651	0.4458	0.3059	0.4889	0.5178
1905	Pahiatua	0.4808	0.352	0.3355	0.2273	0.5213	0.5812
1905	Palmerston	0.4846	0.4523	0.3282	0.3095	0.4601	0.5003
1905	Parnell	0.4614	0.4854	0.3911	0.3847	0.3556	0.5203
1905	Patea	0.29	0.1531	0.1908	0.1661	0.3541	0.2104
1905	Rangitikei	0.4281	0.4724	0.534	0.2042	0.472	0.5178
1905	Riccarton	0.5448	0.5339	0.3267	0.2762	0.4506	0.3814
1905	Selwyn	0.4633	0.4948	0.4281	0.3153	0.466	0.5181
1905	Taieri	0.39	0.4286	0.5166	0.4769	0.5215	0.5849
1905	Taranaki	0.4837	0.4281	0.4176	0.3472	0.5062	0.502
1905	Thames	0.4767	0.4588	0.6299	0.2999	0.5108	0.4927
1905	Timaru	0.4503	0.4382	0.5685	0.3814	0.5212	0.5304
1905	Tuapeka	0.4727	0.5623	0.4462	0.2967	0.539	0.3834
1905	Waiapu	0.4897	0.3365	0.4936	0.3157	0.5096	0.6359
1905	Waikato	0.4753	0.4054	0.4813	0.408	0.4978	0.5523
1905	Waikouaiti	0.3941	0.3829	0.5035	0.5044	0.5442	0.6225
1905	Waipawa	0.4709	0.3952	0.5023	0.3087	0.4933	0.5836
1905	Wairarapa	0.4942	0.4362	0.3485	0.2093	0.4837	0.476
1905	Wairau	0.4707	0.5268	0.376	0.258	0.532	0.3896
1905	Waitaki	0.4522	0.4601	0.4511	0.3055	0.5078	0.5296

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1905	Waitemata	0.5213	0.4356	0.4782	0.3963	0.4494	0.5048
1905	Wakatipu	0.5329	0.227	0.254	0.1242	0.3529	0.1656
1905	Wallace	0.5549	0.3312	0.5089	0.3996	0.5149	0.5755
1905	Wanganui	0.519	0.5038	0.3464	0.3475	0.4826	0.4815
1905	Westland	0.4178	0.662	0.4169	0.2606	0.5941	0.2645
1908	Avon	0.423	0.4656	0.4753	0.4259	0.5282	0.5298
1908	Awarua	0.4266	0.4915	0.53	0.356	0.5102	0.5115
1908	Bay of Islands	0.3614	0.5953	0.5402	0.2544	0.5518	0.3932
1908	Bay of Plenty	0.3654	0.6269	0.4893	0.1682	0.6261	0.3273
1908	Bruce	0.3396	0.4077	0.6035	0.3914	0.5871	0.613
1908	Buller	0.4684	0.4074	0.5137	0.2964	0.5168	0.5266
1908	Chalmers	0.4093	0.4181	0.6114	0.3953	0.6025	0.536
1908	Dunedin South	0.4144	0.4543	0.5663	0.432	0.5588	0.534
1908	Eden	0.3156	0.3689	0.681	0.5175	0.6573	0.5847
1908	Egmont	0.3756	0.4246	0.321	0.3813	0.5812	0.5246
1908	Ellesmere	0.4845	0.5089	0.3741	0.2835	0.4901	0.4122
1908	Franklin	0.5019	0.3652	0.5391	0.4427	0.4926	0.5963
1908	Geraldine	0.4775	0.3911	0.4963	0.4052	0.4756	0.5937
1908	Gisborne	0.4826	0.4285	0.4602	0.3139	0.5247	0.5103
1908	Grey	0.4391	0.6089	0.3498	0.2309	0.5388	0.3463
1908	Hawke's Bay	0.4035	0.5794	0.3537	0.1856	0.5569	0.3246
1908	Hurunui	0.4123	0.6435	0.3731	0.2212	0.5864	0.311
1908	Hutt	0.4324	0.3548	0.5092	0.4284	0.567	0.6028
1908	Kaiapoi	0.3987	0.471	0.5876	0.3868	0.5425	0.5492
1908	Kaipara	0.4524	0.4763	0.4982	0.3982	0.5393	0.4821
1908	Lyttelton	0.4523	0.4825	0.4986	0.3477	0.5204	0.4793
1908	Manawatu	0.4929	0.4321	0.3843	0.2703	0.5028	0.4879
1908	Manukau	0.3346	0.4365	0.5757	0.5056	0.6003	0.5692
1908	Marsden	0.4768	0.3821	0.5079	0.4364	0.4706	0.6129
1908	Masterton	0.4167	0.3589	0.5552	0.387	0.5317	0.6489
1908	Motueka	0.4254	0.5548	0.4503	0.2792	0.5293	0.4156
1908	Napier	0.4803	0.5359	0.4702	0.3141	0.4664	0.4403
1908	Nelson	0.4882	0.4403	0.4952	0.402	0.4983	0.4917
1908	Ohinemuri	0.5047	0.2876	0.5052	0.3685	0.4125	0.7331
1908	Oroua	0.4071	0.5443	0.3465	0.3021	0.492	0.492
1908	Otaki	0.4237	0.4949	0.5308	0.2498	0.544	0.4749
1908	Pahiatua	0.5069	0.3656	0.3951	0.2734	0.5778	0.5183
1908	Palmerston	0.5501	0.4569	0.3432	0.2726	0.4576	0.4527
1908	Parnell	0.3022	0.5038	0.6309	0.3988	0.5358	0.5645
1908	Patea	0.4079	0.4957	0.4922	0.3578	0.5402	0.5003
1908	Rangitikei	0.373	0.6404	0.3444	0.1232	0.6001	0.3024
1908	Riccarton	0.5166	0.4591	0.4745	0.3495	0.4888	0.4891
1908	Selwyn	0.3832	0.6223	0.476	0.2413	0.5766	0.3659
1908	Stratford	0.4717	0.452	0.4209	0.2547	0.5159	0.5077
1908	Taieri	0.4625	0.3412	0.485	0.5257	0.4985	0.6445
1908	Taranaki	0.459	0.4378	0.4582	0.3557	0.5465	0.5398
1908	Taumarunui	0.3282	0.6203	0.5653	0.14	0.6656	0.3178
1908	Tauranga	0.4364	0.4441	0.5259	0.382	0.4847	0.5706
1908	Thames	0.4782	0.4349	0.4851	0.4179	0.5244	0.5134
1908	Timaru	0.4245	0.4483	0.4304	0.4068	0.538	0.5133

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1908	Tuapeka	0.4324	0.4645	0.4029	0.2623	0.5184	0.5047
1908	Waikato	0.6634	0.4395	0.5297	0.4289	0.6541	0.5646
1908	Waipawa	0.4274	0.4442	0.4794	0.3196	0.5313	0.5535
1908	Wairarapa	0.4205	0.4629	0.4429	0.2869	0.5374	0.5351
1908	Wairau	0.4639	0.4968	0.4288	0.3085	0.5252	0.4645
1908	Waitaki	0.4768	0.4103	0.4785	0.3807	0.4764	0.5911
1908	Waitemata	0.435	0.3874	0.5394	0.4526	0.5542	0.5612
1908	Wakatipu	0.4431	0.6106	0.5317	0.1922	0.6493	0.3089
1908	Wallace	0.4764	0.5028	0.5515	0.255	0.5228	0.4691
1908	Wanganui	0.4854	0.3976	0.4252	0.3063	0.4808	0.5756
1908	Wellington South	0.2927	0.3916	0.5298	0.5321	0.6389	0.6064
1908	Wellington Suburbs	0.3279	0.3788	0.5902	0.4379	0.6711	0.5921
1908	Westland	0.4826	0.6371	0.3117	0.1976	0.46	0.2832
1911	Avon	0.4558	0.5045			0.4463	0.4877
1911	Awarua	0.4806	0.4796			0.4561	0.5107
1911	Bay of Islands	0.4648	0.4678			0.4512	0.5211
1911	Bay of Plenty	0.4426	0.554			0.5243	0.4131
1911	Buller	0.473	0.4633			0.4658	0.5355
1911	Chalmers	0.3826	0.4577			0.4996	0.5591
1911	Dunedin South	0.4616	0.5168			0.5046	0.4821
1911	Egmont	0.4583	0.42			0.4545	0.5565
1911	Ellesmere	0.4707	0.5342			0.5213	0.4039
1911	Franklin	0.5	0.3859			0.5567	0.527
1911	Grey	0.466	0.6347			0.5003	0.3362
1911	Hawke's Bay	0.5165	0.5049			0.5941	0.2812
1911	Hurunui	0.4171	0.6962			0.5618	0.2715
1911	Hutt	0.4869	0.5571			0.4315	0.4779
1911	Kaiapoi	0.4368	0.4617			0.5245	0.4462
1911	Kaipara	0.4883	0.4024			0.4394	0.5242
1911	Lyttelton	0.5098	0.5083			0.4706	0.4676
1911	Manukau	0.376	0.4714			0.6356	0.4555
1911	Marsden	0.5807	0.3215			0.4416	0.621
1911	Motueka	0.4282	0.6469			0.5623	0.3253
1911	Napier	0.4984	0.5752			0.4491	0.4102
1911	Nelson	0.4465	0.5361			0.3943	0.4742
1911	Oroua	0.4333	0.5077			0.4786	0.5168
1911	Otago Central	0.4177	0.5546			0.5048	0.4563
1911	Otaki	0.434	0.5101			0.4924	0.4106
1911	Pahiatua	0.4439	0.4698			0.5195	0.4241
1911	Palmerston	0.5101	0.5099			0.4435	0.4699
1911	Parnell	0.3382	0.5945			0.449	0.4928
1911	Patea	0.4642	0.4357			0.4723	0.5457
1911	Raglan	0.5559	0.286			0.4565	0.614
1911	Rangitikei	0.4527	0.5618			0.5674	0.3529
1911	Riccarton	0.485	0.5086			0.4427	0.4472
1911	Selwyn	0.4077	0.6413			0.5112	0.3791
1911	Stratford	0.4518	0.4621			0.4567	0.5315
1911	Taranaki	0.398	0.505			0.4801	0.5227
1911	Taumarunui	0.3869	0.6272			0.5433	0.3569
1911	Tauranga	0.4582	0.4965			0.4817	0.4923

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1911	Temuka	0.4829	0.5095			0.4936	0.4574
1911	Thames	0.4947	0.4884			0.5075	0.4638
1911	Timaru	0.3781	0.5337			0.4898	0.5198
1911	Waikato	0.4823	0.4041			0.5851	0.4928
1911	Waimarino	0.384	0.6801			0.63	0.1904
1911	Waipawa	0.4939	0.4746			0.4822	0.4907
1911	Wairarapa	0.4883	0.6058			0.5549	0.3308
1911	Wairau	0.4982	0.5425			0.3892	0.3995
1911	Waitaki	0.4928	0.4619			0.5161	0.4326
1911	Waitemata	0.3962	0.4629			0.5366	0.4802
1911	Wallace	0.4665	0.5522			0.5394	0.3929
1911	Wanganui	0.4192	0.5046			0.487	0.4539
1911	Westland	0.3941	0.743			0.5362	0.2225
1914	Avon	0.465	0.6249			0.5345	0.4503
1914	Awarua	0.5263	0.4543			0.5336	0.3537
1914	Bay of Islands	0.4422	0.7112			0.4203	0.5832
1914	Bay of Plenty	0.3248	0.8798			0.4694	0.4546
1914	Buller	0.6605	0.2803			0.498	0.3805
1914	Chalmers	0.4087	0.5729			0.495	0.4331
1914	Dunedin South	0.6498	0.5291			0.3865	0.4856
1914	Egmont	0.5463	0.4392			0.5011	0.4468
1914	Ellesmere	0.4807	0.6333			0.5035	0.3863
1914	Franklin	0.4628	0.6316			0.519	0.6626
1914	Gisborne	0.606	0.7508			0.4716	0.4859
1914	Grey Lynn	0.4319	0.6046			0.3018	0.4422
1914	Hawke's Bay	0.5119	0.7432			0.5148	0.3919
1914	Hurunui	0.4577	0.7298			0.516	0.2508
1914	Hutt	0.6151	0.6168			0.3793	0.3917
1914	Kaiapoi	0.4027	0.5687			0.4761	0.422
1914	Kaipara	0.5511	0.5819			0.4753	0.5888
1914	Lyttelton	0.5355	0.6295			0.5498	0.4669
1914	Manukau	0.6157	0.6066			0.7661	0.5899
1914	Marsden	0.4519	0.5118			0.4901	0.5568
1914	Motueka	0.6646	0.7317			0.501	0.3255
1914	Napier	0.5903	0.6776			0.3609	0.4097
1914	Nelson	0.6379	0.5726			0.3904	0.4709
1914	Oroua	0.5205	0.5694			0.4761	0.4136
1914	Otago Central	0.4942	0.6332			0.4265	0.4038
1914	Otaki	0.4648	0.6013			0.5364	0.3098
1914	Pahiatua	0.5199	0.5117			0.497	0.3057
1914	Palmerston	0.5639	0.5983			0.4887	0.4056
1914	Parnell	0.4955	0.57			0.6512	0.3938
1914	Patea	0.5085	0.5903			0.4938	0.4889
1914	Raglan	0.5098	0.5982			0.3926	0.7504
1914	Rangitikei	0.5015	0.6148			0.4442	0.3452
1914	Riccarton	0.6358	0.5364			0.4884	0.4298
1914	Selwyn	0.5033	0.6751			0.4913	0.3888
1914	Stratford	0.56	0.3468			0.5215	0.365
1914	Taranaki	0.4067	0.5764			0.5362	0.4237
1914	Taumarunui	0.7624	0.895			0.4474	0.5503

Year	Electorate	Non-Parametric Estimate Women's Local Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local Reduction Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local Reduction Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's Local No License Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's Local No License Vote / Total Votes Cast by Men
1914	Tauranga	0.4891	0.695			0.4809	0.5909
1914	Temuka	0.4854	0.641			0.5346	0.395
1914	Thames	0.5473	0.4844			0.4376	0.5319
1914	Timaru	0.495	0.5822			0.4248	0.4954
1914	Waikato	0.5465	0.5952			0.5538	0.6037
1914	Waimarino	0.3774	0.7735			0.5988	0.225
1914	Waipawa	0.5234	0.615			0.465	0.3639
1914	Wairarapa	0.5217	0.7195			0.4641	0.3251
1914	Wairau	0.5848	0.6044			0.3982	0.3671
1914	Waitaki	0.5411	0.5392			0.4875	0.5187
1914	Waitemata	0.5244	0.5882			0.5876	0.5662
1914	Wakatipu	0.5016	0.5364			0.4908	0.2407
1914	Wallace	0.4425	0.6787			0.4935	0.3401
1914	Wanganui	0.517	0.6031			0.4638	0.3957
1914	Westland	0.5092	0.5186			0.4361	0.2083

Appendix 4

Non-Parametric Electorate Estimates of Women's and Men's Votes at National Licensing Polls, 1911-1919

Year	Electorate	Non-Parametric Estimate Women's National Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's National Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's National Prohibition Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's National Prohibition Vote / Total Votes Cast by Men
1911	Ashburton	0.4709	0.4909	0.5158	0.3993
1911	Avon	0.3783	0.4449	0.5247	0.5275
1911	Awarua	0.4961	0.335	0.4962	0.5832
1911	Bay of Islands	0.4598	0.3748	0.4613	0.6094
1911	Bay of Plenty	0.46	0.3748	0.4708	0.589
1911	Bruce	0.5073	0.3597	0.4718	0.6009
1911	Buller	0.5147	0.2846	0.4429	0.6721
1911	Chalmers	0.346	0.3734	0.5444	0.6102
1911	Clutha	0.4933	0.3597	0.4983	0.6026
1911	Dunedin South	0.4572	0.3966	0.5618	0.5253
1911	Eden	0.2652	0.3531	0.7281	0.5867
1911	Egmont	0.4266	0.2729	0.4952	0.6938
1911	Ellesmere	0.4934	0.4333	0.4818	0.4804
1911	Franklin	0.4173	0.4114	0.5174	0.5737
1911	Grey	0.408	0.4734	0.5361	0.4998
1911	Grey Lynn	0.1978	0.3396	0.7487	0.5362
1911	Hawke's Bay	0.5095	0.3346	0.568	0.457
1911	Hurunui	0.4332	0.5449	0.5593	0.3705
1911	Hutt	0.4057	0.465	0.5071	0.5524
1911	Invercargill	0.4155	0.4302	0.5085	0.5272
1911	Kaiapoi	0.392	0.409	0.4668	0.5616
1911	Kaipara	0.4534	0.3293	0.444	0.5927
1911	Lyttelton	0.5259	0.3959	0.4989	0.5142
1911	Manukau	0.3408	0.4525	0.5566	0.5614
1911	Marsden	0.4349	0.3322	0.5019	0.6606
1911	Masterton	0.4071	0.4573	0.4422	0.5154
1911	Mataura	0.4608	0.414	0.527	0.5449
1911	Motueka	0.405	0.532	0.5235	0.4386
1911	Napier	0.4599	0.4177	0.4875	0.553
1911	Nelson	0.4888	0.3906	0.4275	0.4849
1911	Oamaru	0.4182	0.4513	0.5049	0.5543
1911	Ohinemuri	0.4423	0.4178	0.4863	0.5458
1911	Oroua	0.4219	0.3507	0.5294	0.6233
1911	Otago Central	0.4188	0.4343	0.4856	0.5603
1911	Otaki	0.4727	0.349	0.5446	0.4857
1911	Pahiatua	0.4539	0.3183	0.5054	0.558
1911	Palmerston	0.4096	0.426	0.5274	0.5619
1911	Parnell	0.4508	0.4094	0.3702	0.6077
1911	Patea	0.3972	0.3299	0.4663	0.6928
1911	Raglan	0.4783	0.2562	0.4802	0.6598
1911	Rangitikei	0.4817	0.3839	0.5085	0.5318
1911	Riccarton	0.4336	0.4344	0.4639	0.5212
1911	Selwyn	0.4487	0.51	0.4914	0.4688
1911	Stratford	0.5187	0.2832	0.4939	0.6409

Year	Electorate	Non-Parametric Estimate Women's National Continuance Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's National Continuance Vote / Total Votes Cast by Men	Non-Parametric Estimate Women's National Prohibition Vote / Total Votes Cast by Women	Non-Parametric Estimate Men's National Prohibition Vote / Total Votes Cast by Men
1911	Taranaki	0.378	0.3683	0.615	0.543
1911	Taumarunui	0.3949	0.521	0.5426	0.4597
1911	Tauranga	0.4856	0.3417	0.4945	0.5979
1911	Temuka	0.4559	0.3893	0.5227	0.532
1911	Thames	0.5308	0.3376	0.519	0.5635
1911	Timaru	0.3432	0.4256	0.5588	0.5553
1911	Waikato	0.4082	0.3429	0.5876	0.5992
1911	Waimarino	0.358	0.5091	0.6012	0.3607
1911	Waipawa	0.4396	0.3516	0.4959	0.6273
1911	Wairarapa	0.4442	0.5164	0.5196	0.4342
1911	Wairau	0.505	0.4157	0.4875	0.4062
1911	Waitaki	0.4598	0.382	0.5236	0.5122
1911	Waitemata	0.3212	0.4589	0.5571	0.5155
1911	Wallace	0.4414	0.4167	0.567	0.4997
1911	Wanganui	0.3852	0.3789	0.5389	0.5508
1911	Wellington South	0.3039	0.4429	0.6167	0.5051
1911	Westland	0.4308	0.5058	0.5479	0.3971
1914	Ashburton	0.5131	0.5778	0.4987	0.3695
1914	Avon	0.47	0.4828	0.5261	0.4662
1914	Awarua	0.4766	0.479	0.559	0.4312
1914	Bay of Islands	0.4951	0.504	0.5215	0.4466
1914	Bay of Plenty	0.4188	0.5755	0.4825	0.4249
1914	Bruce	0.4246	0.5273	0.4974	0.486
1914	Buller	0.5664	0.3499	0.5073	0.5433
1914	Chalmers	0.3532	0.5564	0.5511	0.4431
1914	Clutha	0.474	0.4555	0.4715	0.5361
1914	Dunedin South	0.5714	0.4787	0.3918	0.5112
1914	Eden	0.2818	0.4287	0.6979	0.5377
1914	Egmont	0.5352	0.3415	0.5119	0.5416
1914	Ellesmere	0.4866	0.5482	0.5064	0.3876
1914	Franklin	0.5107	0.3889	0.4471	0.587
1914	Gisborne	0.4554	0.5535	0.4865	0.4618
1914	Grey	0.5012	0.5196	0.6591	0.7991
1914	Grey Lynn	0.3055	0.4891	0.231	0.4846
1914	Hawke's Bay	0.5355	0.461	0.4765	0.4431
1914	Hurunui	0.4641	0.662	0.536	0.29
1914	Hutt	0.4968	0.5787	0.4576	0.4046
1914	Invercargill	0.4487	0.4965	0.5313	0.4834
1914	Kaiapoi	0.4259	0.5204	0.5085	0.4787
1914	Kaipara	0.5211	0.3988	0.4359	0.5696
1914	Lyttelton	0.4875	0.4982	0.5256	0.445
1914	Manukau	0.3876	0.5025	0.5327	0.5042
1914	Marsden	0.4812	0.3868	0.5113	0.5668
1914	Masterton	0.4394	0.577	0.5055	0.417
1914	Mataura	0.5147	0.4137	0.4548	0.5534
1914	Motueka	0.459	0.6617	0.4982	0.2986
1914	Napier	0.5187	0.5809	0.453	0.3801
1914	Nelson	0.5254	0.5345	0.3903	0.4651
1914	Oamaru	0.4748	0.4868	0.545	0.4331
1914	Ohinemuri	0.5191	0.3918	0.4528	0.5873

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1914	Oroua	0.4926	0.44	0.4679	0.5268
1914	Otago Central	0.4435	0.5601	0.5401	0.3913
1914	Otaki	0.4358	0.6089	0.4904	0.3718
1914	Pahiatua	0.5046	0.4902	0.5293	0.4247
1914	Palmerston	0.4625	0.511	0.4979	0.4695
1914	Parnell	0.4361	0.518	0.4615	0.5317
1914	Patea	0.5089	0.4054	0.5119	0.5209
1914	Raglan	0.5273	0.364	0.4581	0.5941
1914	Rangitikei	0.4632	0.5719	0.5031	0.3922
1914	Riccarton	0.5043	0.5256	0.4523	0.4537
1914	Selwyn	0.4069	0.6351	0.517	0.3543
1914	Stratford	0.558	0.3329	0.4721	0.5718
1914	Taranaki	0.4122	0.4328	0.545	0.5393
1914	Taumarunui	0.428	0.6188	0.5622	0.3385
1914	Tauranga	0.4853	0.4341	0.5152	0.5166
1914	Temuka	0.4789	0.5182	0.5513	0.4015
1914	Thames	0.5088	0.367	0.4395	0.6171
1914	Timaru	0.4011	0.5456	0.5372	0.4644
1914	Waikato	0.5637	0.3095	0.4418	0.6387
1914	Waimarino	0.3687	0.6889	0.5842	0.2883
1914	Waipawa	0.5102	0.5029	0.5096	0.4093
1914	Wairarapa	0.4185	0.6417	0.5395	0.3163
1914	Wairau	0.5253	0.5844	0.3774	0.4247
1914	Waitaki	0.4925	0.4276	0.4659	0.5554
1914	Waitemata	0.4503	0.4737	0.5307	0.4926
1914	Wakatipu	0.4421	0.6208	0.5665	0.3104
1914	Wallace	0.478	0.5657	0.554	0.3397
1914	Wanganui	0.4751	0.473	0.5333	0.4485
1914	Wellington South	0.4798	0.5137	0.4703	0.4796
1914	Wellington Suburbs	0.4455	0.5418	0.5269	0.4454
1914	Westland	0.4583	0.609	0.5481	0.3041
1919 Apr	Ashburton	0.5018	0.5677	0.5153	0.4011
1919 Apr	Auckland Central	0.6015	0.6542	0.3881	0.3381
1919 Apr	Auckland East	0.6406	0.4678	0.3989	0.4628
1919 Apr	Auckland West	0.4348	0.5454	0.5314	0.4765
1919 Apr	Avon	0.3876	0.541	0.5699	0.4894
1919 Apr	Awarua	0.467	0.4764	0.5559	0.4793
1919 Apr	Bay of Islands	0.5069	0.4379	0.5445	0.5053
1919 Apr	Bay of Plenty	0.4448	0.5592	0.5443	0.4329
1919 Apr	Bruce	0.3519	0.5766	0.5865	0.4765
1919 Apr	Buller	0.3624	0.6956	0.5285	0.3705
1919 Apr	Chalmers	0.3188	0.369	0.6747	0.5903
1919 Apr	Christchurch East	0.6501	0.4993	0.324	0.4993
1919 Apr	Christchurch North	0.457	0.5011	0.4943	0.5377
1919 Apr	Christchurch South	0.4317	0.5302	0.5865	0.4344
1919 Apr	Clutha	0.4624	0.3749	0.5008	0.6414
1919 Apr	Dunedin Central	0.3992	0.484	0.6041	0.4872
1919 Apr	Dunedin North	0.2649	0.5347	0.7217	0.46
1919 Apr	Dunedin South	0.2762	0.6121	0.697	0.4027
1919 Apr	Dunedin West	0.3467	0.5367	0.632	0.4672

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1919 Apr	Eden	0.2806	0.4611	0.748	0.4841
1919 Apr	Egmont	0.4258	0.4739	0.5503	0.523
1919 Apr	Ellesmere	0.4412	0.634	0.5322	0.3708
1919 Apr	Forces:Egypt	0.2704	0.8124	0.7112	0.1878
1919 Apr	Forces:France	0.2181	0.9069	0.7513	0.0934
1919 Apr	Forces:New Zealand	0.2751	0.7285	0.6893	0.2718
1919 Apr	Forces:On Board Troopships	0.2252	0.8543	0.7606	0.1459
1919 Apr	Forces:Samoa	0.2475	0.746	0.6569	0.255
1919 Apr	Forces:United Kingdom	0.2938	0.8061	0.6773	0.1942
1919 Apr	Franklin	0.3804	0.405	0.6116	0.5813
1919 Apr	Gisborne	0.4458	0.5313	0.5588	0.4439
1919 Apr	Grey	0.6083	0.6551	0.3694	0.3478
1919 Apr	Grey Lynn	0.3057	0.5898	0.6309	0.4747
1919 Apr	Hawke's Bay	0.447	0.542	0.5578	0.4323
1919 Apr	Hurunui	0.3896	0.7254	0.5256	0.3177
1919 Apr	Hutt	0.4945	0.5321	0.4448	0.5145
1919 Apr	Invercargill	0.356	0.5178	0.6527	0.456
1919 Apr	Kaiapoi	0.4925	0.5286	0.5498	0.4177
1919 Apr	Kaipara	0.4283	0.4927	0.5306	0.5259
1919 Apr	Lyttelton	0.4053	0.5793	0.523	0.4794
1919 Apr	Manukau	0.3214	0.5244	0.6148	0.5303
1919 Apr	Marsden	0.4841	0.3263	0.5525	0.6285
1919 Apr	Masterton	0.4314	0.5549	0.5329	0.4653
1919 Apr	Mataura	0.5169	0.38	0.4794	0.6066
1919 Apr	Motueka	0.429	0.679	0.564	0.3034
1919 Apr	Napier	0.4676	0.5301	0.4533	0.5328
1919 Apr	Nelson	0.4572	0.5685	0.4875	0.4821
1919 Apr	Oamaru	0.3338	0.5692	0.603	0.491
1919 Apr	Ohinemuri	0.4294	0.6103	0.5588	0.385
1919 Apr	Oroua	0.4714	0.4209	0.5477	0.5502
1919 Apr	Otago Central	0.4442	0.5021	0.528	0.4997
1919 Apr	Otaki	0.4203	0.5468	0.5308	0.4916
1919 Apr	Pahiatua	0.4145	0.5663	0.5441	0.4434
1919 Apr	Palmerston	0.3854	0.5204	0.5706	0.5162
1919 Apr	Parnell	0.3525	0.5646	0.6094	0.4615
1919 Apr	Patea	0.4208	0.4329	0.557	0.5648
1919 Apr	Raglan	0.4476	0.3907	0.486	0.6514
1919 Apr	Rangitikei	0.4826	0.5094	0.5456	0.4497
1919 Apr	Riccarton	0.4847	0.5059	0.5449	0.4425
1919 Apr	Selwyn	0.3715	0.6844	0.6037	0.319
1919 Apr	Stratford	0.4648	0.3662	0.5427	0.6165
1919 Apr	Taranaki	0.3902	0.4123	0.6421	0.5313
1919 Apr	Taumarunui	0.4537	0.5986	0.5796	0.3601
1919 Apr	Tauranga	0.4247	0.4992	0.5731	0.4911
1919 Apr	Temuka	0.4781	0.5519	0.5424	0.4107
1919 Apr	Thames	0.4796	0.4467	0.5332	0.5235
1919 Apr	Timaru	0.3428	0.5077	0.6182	0.5125
1919 Apr	Waikato	0.3919	0.4599	0.6239	0.5033
1919 Apr	Waimarino	0.3512	0.7103	0.5906	0.3055

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1919 Apr	Waipawa	0.4792	0.5437	0.5207	0.4431
1919 Apr	Wairarapa	0.3886	0.6523	0.5587	0.375
1919 Apr	Wairau	0.4586	0.5748	0.5494	0.3979
1919 Apr	Waitaki	0.4138	0.5043	0.5136	0.5419
1919 Apr	Waitemata	0.4964	0.3645	0.5186	0.612
1919 Apr	Wakatipu	0.4406	0.5849	0.5431	0.4028
1919 Apr	Wallace	0.4438	0.5754	0.626	0.3462
1919 Apr	Wanganui	0.4135	0.5348	0.5518	0.4793
1919 Apr	Wellington Central	0.5827	0.6602	0.3736	0.3448
1919 Apr	Wellington East	0.508	0.488	0.4621	0.5239
1919 Apr	Wellington North	0.6744	0.466	0.333	0.503
1919 Apr	Wellington South	0.5258	0.477	0.5112	0.4572
1919 Apr	Wellington Suburbs	0.4525	0.5156	0.4896	0.5256
1919 Apr	Westland	0.5663	0.7615	0.3879	0.2618
1919 Dec	Ashburton	0.4559	0.5152	0.5511	0.343
1919 Dec	Avon	0.3721	0.4368	0.6418	0.3995
1919 Dec	Awarua	0.4483	0.4121	0.4896	0.5241
1919 Dec	Bay of Islands	0.4712	0.4193	0.4831	0.5611
1919 Dec	Bay of Plenty	0.3589	0.5618	0.5801	0.3361
1919 Dec	Bruce	0.4975	0.3934	0.4942	0.4825
1919 Dec	Buller	0.4373	0.4742	0.4856	0.4364
1919 Dec	Chalmers	0.3953	0.4102	0.5416	0.5637
1919 Dec	Clutha	0.4504	0.3816	0.4645	0.584
1919 Dec	Dunedin South	0.3343	0.5148	0.6107	0.4462
1919 Dec	Eden	0.3908	0.3572	0.5348	0.59
1919 Dec	Egmont	0.4884	0.3875	0.4827	0.5369
1919 Dec	Ellesmere	0.5007	0.5032	0.4342	0.4338
1919 Dec	Franklin	0.4393	0.3235	0.4453	0.638
1919 Dec	Gisborne	0.4823	0.3778	0.5113	0.4396
1919 Dec	Grey Lynn	0.293	0.4838	0.6607	0.4391
1919 Dec	Hawke's Bay	0.4976	0.4301	0.558	0.3713
1919 Dec	Hurunui	0.4441	0.5618	0.5602	0.3257
1919 Dec	Hutt	0.4744	0.46	0.471	0.434
1919 Dec	Invercargill	0.2785	0.4538	0.5873	0.4616
1919 Dec	Kaiapoi	0.4314	0.4806	0.5173	0.463
1919 Dec	Kaipara	0.4794	0.3893	0.4623	0.5366
1919 Dec	Lyttelton	0.3938	0.434	0.5502	0.4643
1919 Dec	Manawatu	0.4621	0.4409	0.5247	0.4516
1919 Dec	Manukau	0.353	0.432	0.492	0.5908
1919 Dec	Marsden	0.3875	0.3315	0.4915	0.6508
1919 Dec	Masterton	0.4499	0.4242	0.5606	0.4027
1919 Dec	Mataura	0.4196	0.3627	0.5387	0.5151
1919 Dec	Motueka	0.4088	0.5604	0.5803	0.2739
1919 Dec	Napier	0.4009	0.4879	0.4148	0.4961
1919 Dec	Nelson	0.4498	0.405	0.3986	0.5352
1919 Dec	Oamaru	0.4224	0.396	0.5047	0.521
1919 Dec	Ohinemuri	0.4356	0.3496	0.5429	0.3855
1919 Dec	Oroua	0.4785	0.3727	0.4726	0.571
1919 Dec	Otaki	0.483	0.4344	0.4862	0.4111
1919 Dec	Pahiatua	0.4878	0.4263	0.4646	0.5108

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1919 Dec	Palmerston	0.4461	0.4075	0.542	0.4996
1919 Dec	Parnell	0.2992	0.44	0.6794	0.4459
1919 Dec	Patea	0.4123	0.4287	0.5059	0.5606
1919 Dec	Raglan	0.4099	0.4204	0.5351	0.4488
1919 Dec	Rangitikei	0.4618	0.4441	0.5222	0.4612
1919 Dec	Riccarton	0.4129	0.4394	0.5229	0.4888
1919 Dec	Roskill	0.1772	0.4084	0.8413	0.4442
1919 Dec	Rotorua	0.473	0.4357	0.4736	0.4694
1919 Dec	Stratford	0.5011	0.2953	0.4058	0.6848
1919 Dec	Taranaki	0.3632	0.3648	0.5914	0.5653
1919 Dec	Tauranga	0.4991	0.3704	0.5297	0.4897
1919 Dec	Temuka	0.4472	0.4834	0.5282	0.4017
1919 Dec	Thames	0.4487	0.3815	0.5183	0.5178
1919 Dec	Timaru	0.3446	0.491	0.6014	0.4402
1919 Dec	Waikato	0.3299	0.416	0.5593	0.5727
1919 Dec	Waimarino	0.2413	0.7787	0.6584	0.123
1919 Dec	Waipawa	0.4848	0.4255	0.5375	0.4051
1919 Dec	Wairarapa	0.4793	0.4839	0.5416	0.3871
1919 Dec	Wairau	0.5575	0.4448	0.3871	0.5063
1919 Dec	Waitaki	0.4815	0.4305	0.5284	0.461
1919 Dec	Waitemata	0.3295	0.4323	0.6536	0.4426
1919 Dec	Waitomo	0.3869	0.5627	0.6052	0.2715
1919 Dec	Wakatipu	0.444	0.5846	0.5618	0.3048
1919 Dec	Wallace	0.4386	0.5096	0.5176	0.4128
1919 Dec	Wanganui	0.4419	0.4563	0.5435	0.4573
1919 Dec	Wellington South	0.404	0.4741	0.4495	0.4805
1919 Dec	Wellington Suburbs	0.3569	0.4312	0.4847	0.5009
1919 Dec	Westland	0.4836	0.6174	0.4358	0.2869